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NOTES

ON THE

MEDICAL TOPOGRAPHY

OF THE

Interior of Ceylon;

AND ON THE

HEALTH OF THE TROOPS EMPLOYED IN THE KANDYAN PROVINCES,

DURING THE YEARS

1815, 1816, 1817, 1818, 1819, AND 1820:

WITH

BRIEF REMARKS ON THE PREVAILING DISEASES.

BY HENRY MARSHALL,
SURGEON TO THE FORCES.

"Humble as the labours may seem, and confined as the abilities of an individual "may be, were he only faithfully to relate observations made with care, to "compare them with those of his cotemporaries, and by those to correct the "opinions of his predecessors, he would perform no mean service to his art."
Medical Sketches, by Sir JAMES M'GRIGOR.

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TO

SIR JAMES M'GRIGOR, M. D. F. R. S.

Director-General of the Army Medical Department,
&c. &c. &c.

THE FOLLOWING PAGES

ARE RESPECTFULLY

Dedicated,

AS

A TESTIMONY OF GRATITUDE AND ESTEEM,

BY

HIS DEVOTED SERVANT,

THE AUTHOR.

PREFACE.

In the topographical portion of the following pages, I have described the more remarkable natural phenomena of the interior of Ceylon, which, in a less or greater degree, may affect the health of Troops stationed in the Kandyan provinces. Perhaps I have been too prolix in describing the manners of the indigenous inhabitants, and the means they adopt in the cure of diseases. It must be admitted, that the views entertained by the Kandyans of the healing art, do not promise to be of much utility. Curiosity may, however, be gratified by a specimen of the absurd notions they profess to believe on this subject.

The opinions of the Kandyan doctors respecting the pathology and treatment of the ulcers, &c. which occasionally follow promiscuous sexual intercourse, are interesting. They do not differ very materially from the sentiments entertained of the venereal disease by a number of medical men of the present day in Europe.

The advantages of correct hospital returns are universally acknowledged. On an extensive scale

they excite much interest, more especially by showing the relative prevalence of certain diseases on different services, and in situations and climates dissimilar, as also the proportionate fatality of particular diseases, and the ratio of mortality. In as far as regards the Europeans, I have, in the Tables and Returns for the years 1817 to 1820 inclusive, endeavoured to fulfil the above desirable objects. The Tables for the years 1815 and 1816 are unavoidably defective in many respects. There being four classes of troops employed in the Kandyan provinces, the returns have, on that account, some variety.

I consider the Tables and Returns the most interesting portion of the Notes. Whatever merit they may be deemed to possess, it belongs, in an eminent degree, to Sir James M'Grigor, and Dr. Charles Farrell, Deputy Inspector of Hospitals. Shortly after Sir James M'Grigor assumed the direction of the medical department, he made many improvements in the mode of conducting the medical concerns of the army, particularly regarding accurate and comprehensive sick returns. These improvements were rendered effective in Ceylon, by Dr. Farrell. Hence I was enabled to compile the Returns contained in the following pages. Much has been done by Dr. Farrell for the advancement of the medical department in Ceylon, by encouraging application among the officers, and by promoting the means of improvement. Under his auspices a medical library has been commenced, which must,

in the course of time, contribute to the diffusion of much useful information. Dr. Farrell's eminent professional and scientific acquirements, his firmness, sound judgment, and long experience, have gained him the esteem and respect of the officers of the department which he so ably superintends. Through his zeal and influence he has excited a new spirit of diligence and observation among the medical officers under his control.

With regard to the remarks respecting particular diseases, they are avowedly cursory and incomplete. The remote causes of disease are, for the most part, extremely obscure. On this subject I have been more solicitous to detail facts, than to deduce inferences.

It may be proper to mention, that I served in Ceylon from 1808 till 1821. About five years of this period I was on duty as surgeon to the forces in the Kandyan provinces.

Great praise is due to Lieut.-colonel Kelly, 83d regiment, who commanded the troops in the Kandyan country during the years 1816 to 1820 inclusive, for the anxious and judicious interest he took in the health and comfort of the men under his command. It is generally beneficial to the service, and always gratifying to medical men, when their sentiments regarding the means of preserving the health of troops, are candidly heard, and effectually promoted, by commanding officers. In this

respect Colonel Kelly is entitled to my grateful acknowledgments.

Not being accustomed to write for the public eye, the Author is aware that his style may be defective in many respects. On this account he solicits the indulgence of his readers. He has been anxious to express himself in terms so as to be clearly understood, and in as few words as the nature of the subject would permit. It is his earnest hope, that the information contained in the Notes may, in some measure, atone for their defects in regard to the accuracy and graces of composition, and plead his apology for obtruding himself before the public as an author.

The chief design of the following Notes, which were written in Ceylon, is to give a brief account of the leading circumstances that came to my notice regarding the health concerns of the troops for the time specified. It has been my endeavour to state facts faithfully, and I claim no other merit.

I am under very great obligation to Dr. Theodore Gordon, Deputy Inspector of Hospitals, for his kindness in perusing my manuscript, and assisting me with his advice respecting its publication. I take this opportunity of expressing my gratitude, and of begging him to accept my warmest thanks.

London,
October, 1821.

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PART I.

ON THE MEDICAL TOPOGRAPHY OF THE INTERIOR OF CEYLON.

CHAPTER I.

Description of the Face of the Country: Climate, Monsoons, Rains, Fogs, thermometrical Tables—Indigenous culinary Plants—Domestic Animals, Cattle, &c.—Murrain—Dogs—Horses—Noxious Animals, Leeches, Snakes.

Ceylon may be divided into an upper and a lower country. The former is situated nearly in the centre of the island, and occupies about an eighth part of its surface: the latter encircles the inland terrace, and is particularly extensive towards the northern extremity of the island. The upper country is elevated from 1400 to 2100, and in some places to 6500 feet above the level of the sea. In general, the acclivities from the lower country are abrupt; they are particularly so on the western rampart of the terrace.

The physical conformation of the upper portion of the island is very singular. The whole face of the country is covered with a congeries of detached heights and undulatory swells, interspersed with high and fantastically-peaked moun-

tains. Many of the heights are long-backed hills; others are conical. In the districts of Ouva and Wallepony many of the hills have tabular summits; a circumstance not observed in any other part of the country. Winding patches of low ground intersect the hills and irregular eminences. These concavities are, for the most part, marshy and very narrow. However deep the hollow may be, there is always an outlet for the water which may fall into it. There are, therefore, no natural lakes in the upper country. The mountains, hills, and even the gentle swells, are in general covered, from their bases to their summits, with trees and low underwood. Indeed, the entire face of the country is nearly overspread with jungle and trees, by which means it has a woody, impenetrable appearance. The hills in Ouva are, for the most part, exceptions to this observation: the mountains in this district are covered with a coarse rank grass, and are, in general, almost destitute of trees.

The woods in tropical regions present an unvarying display of rich verdure. This is particularly the case in Ceylon. Many of the forest-trees yield a constant succession of fresh buds during all seasons of the year, by which means there is always a number of mature and decaying leaves. On this account, and partly because the young leaves of many of the trees and shrubs have a reddish tint, the forests have a brownish shade. The ground is for the most part covered with decayed leaves in a state of decomposition. In the close dells where there is but little ventilation, the decaying twigs and leaves emit a very offensive vapour.

The lower and comparatively flat portion of the island, is of very considerable extent: like the elevated terrace, it is almost completely covered with jungle and forest-trees. The scene is here extremely dull and uniform. There is nothing to diversify the prospect. One forest succeeds another, divided only by narrow strips of unwooded surface, which are for the most part uncultivated. The traveller is frequently in the flat country enveloped for many miles together in thick woods.

In vain he expects, as he moves on, to meet with some variety, some circumstance, connected with the happiness or occupation of man, to interest his feelings. A gloomy stillness and solitude prevail over the whole country. The silence of the forest is seldom interrupted, except by the cooing of wood-pigeons, or the rustling of wild animals, the only inhabitants of the deep jungles. The greatest degree of stillness prevails during the period about noon, when all classes of animals seek shelter from the ardent heat of the sun in the shady recesses of the woods.

On the interior terrace the prospect is frequently extensive; the views are picturesque and comparatively interesting: the extreme irregularity of the surface, the rounded undulating eminences, interspersed with rugged peaks and lofty mountains, generally covered with dense vegetation, and clothed to their summits with trees, arrest the attention. A house is, however, seldom to be seen, and often not a spot of surface under cultivation. For the most part, the entire view comprehends one interminable forest. In as far as regards production, to gratify the wants or answer the conveniences of human beings, great part of both the upper and lower country is quite a desert. In vain the eye ranges over the landscape in the hope of perceiving some picture of domestic comfort, and some mark of the industry and ingenuity of man.

The narrow valleys that intervene between the hills and the less elevated convexities of the surface of the interior, radiate and ramify in a most singular manner: many of the smaller ramifications appear to have originally been nothing more than watercourses, which have been widened by means of manual labour. The soil is, for the most part, rich in these narrow clefts. It is chiefly in these hollows that the rice which sustains the whole population is raised.

Gneiss, of which the mountains are formed, is the prevailing rock. In some places there are large projections of granitic rock, but partially covered with soil or almost entirely

destitute of it. Some of these rise in abrupt acuminated peaks, others are conical.

The roads that lead through the country are mere pathways: these pathways run in a zig-zag direction, and are extremely narrow and rugged. Sometimes they pass over precipitous mountains and along the beds of rivers and ravines. The mountain torrents are crossed by means of one, sometimes of two trees, which stretch from bank to bank. Very often this simple bridge is suspended at each end from a tree. The swinging motion and the resiliency of a single tree bridge terrifies the inexperienced passenger: travelling from one station to another is therefore always tedious and difficult; the transit of the produce of the country, military stores, &c. is laborious and uncertain. The chief mode of conveying grain, &c. is upon men's shoulders; sometimes bullocks are employed for this purpose, the load being placed upon their backs.

A number of considerable rivers have their origin among the mountains of the interior: the rivers that flow westward are in general navigable for small craft, to about forty or fifty miles from the sea. Those that flow eastward are not navigable to almost any extent, on account of rocks and sand-banks which cross their channels. A large extent of the northern extremity of the island has no permanent rivers. Good water is very difficult to be procured in the flats, particularly towards the north of the interior terrace.

There are no natural lakes in the upland portion of the Kandyan country. During heavy rain, and particularly about the time when the monsoons change, the rivers overflow their banks, and cover large tracts of the flats below the hills with water. All intercourse between one station and another is then interrupted, except by means of small boats. Inundations of this kind sometimes extend for a number of miles at one place. The superfluous water is eventually evaporated during the succeeding dry weather.

The air of the interior is influenced both by the south-west and north-east monsoons. The south-west monsoon com-

mences about the latter end of April or beginning of May, and is in general ushered in by strong gusts of wind, thunder, lightning, and torrents of rain. The wind gradually veers from the south-west to west, from which direction it blows until some time after the summer solstice. The north-east monsoon commences about the end of October or beginning of November; and is likewise generally accompanied with heavy rains, thunder, and lightning. The hills of the interior intercept the clouds as they pass over the island during the existence of both monsoons. Hence the frequent rains and genial showers which fertilize the soil and refresh the exuberant foliage of the plants on the hills. The showers are often very partial in extent, and frequently of short duration. Heavy showers are often immediately succeeded by bright sunshine and fine weather, and these alternations are sometimes frequently repeated in the space of an hour. The hilly surface of the elevated terrace tends very considerably to divert the lower strata of the monsoon winds from their direct course, by which means the winds appear to be more variable than on the coasts of the island. The steady influence of the monsoon is, however, very evident, by the regular direction of the higher clouds.

The period between the decline of one monsoon and the steady operation of the other, or during the months of May and October, is frequently marked by heavy morning fogs, occasional strong gusts of wind, and often by heavy rains. In calm weather the fog continues until the morning be far advanced. Long after the fog has disappeared from the tops of the lower hills, it continues to cover the little chasms and valleys that divide them; and, from an elevated point, these vapours appear remarkably dense, marginated, and of an almost snowy whiteness.

When the weather has been for a considerable time dry, the air is frequently arid and uncomfortable. The surface of the earth becomes hardened and divided by deep fissures, particularly where the soil is clayey and tenacious. The great

dryness of the air on the hills, when compared with the humid condition of the atmosphere on the coast, in certain states of weather, is remarkable.

In particular seasons the rains are very heavy, and often continue without much interruption for several days together. During these heavy rains streams are formed, which rush down the sides of the hills, and convert insignificant rivulets into large rivers, that roll along with a tumultuous current, disdaining every impediment. The rivers receive a constant increase from subsidiary rivulets and mountain torrents, which flow into them, and eventually rush down the craggy sides of the precipitous parapet that faces the sea.

The air, on the flat country which stretches along the eastern and northern coast of the island, is very dry and hot during the south-west monsoon. Showers rarely occur there between the months of May and October. During the influence of this monsoon, a hot land-wind blows from the interior towards the eastern and northern coast of the island. This wind sets in about the middle of May, and blows, with but little intermission, till the end of August. In the other months of the year there are regular sea and land breezes. While the land wind prevails there are but rarely any sea breezes. The land wind often blows day and night for several weeks together, without much abatement; it is always very dry and hot: the mercury in a thermometer (Fahrenheit) placed in the shade rises as high as 95°, and sometimes higher. The land wind extends along the coast from Batticaloe to Jafna; perhaps, however, its influence is more felt at Trincomale and in the neighbourhood of this station than at any other place. This wind becomes perceptible almost immediately below the hills that bound the upland terrace towards the north-east. As the wind approaches the coast, it acquires both strength and temperature. In some countries the existence of hot winds has been ascribed to extensive tracts of sand heated by the sun. This cannot be the origin of hot winds in Ceylon, for here they commence shortly after the fall of the rains

which accompany the setting-in of the south-west monsoon, and blow towards the coast over hills covered to their summits with trees, and over swampy valleys, thickly overgrown with low underwood, which extend to the very edge of the sea.

Annexed is an abstract of the range of the thermometer, from the year 1817 to 1820 inclusive, deduced from observations made at the General Hospital in Kandy. To the abstracts for the last three years, the quantity of rain which fell is noted. For the purpose of comparing the temperature of Kandy with that of the eastern coast of the island, I have added an abstract of the range of the thermometer for two years, deduced from observation made at Trincomale, by staff-surgeon Bath. These tables show the variations of temperature which occur in Kandy. The temperature of the air is, however, considerably influenced by situation. In close and confined spots the heat is sometimes very great; in such places I have seen the mercury rise as high as 100° in the shade. The ordinary temperature of a spring called the King's Well, in Kandy, is about 73½. This is nearly the average temperature of the atmosphere. There is a small spring on the top of Adam's Peak, in which I found the temperature to be 53° in the month of April 1819. At five A. M. the thermometer indicated an atmospheric temperature of 51° in the same situation.

Abstract of the Range of the Thermometer, from 1st January to 31st December 1817, deduced from Observations made at the General Hospital, Kandy.

Months.	Medium Temperature, Morning.	Medium Temperature, Mid-day.	Medium Temperature, Night.	Highest Temperature.	Lowest.	Greatest Variation in 24 Hours.	Mean monthly Temperature.	Rain, Inches and Tenths.	
January	70	$76\frac{2}{3}$	$75\frac{1}{2}$	80	67	9	$72\frac{2}{3}$	—	
February	$70\frac{1}{2}$	$76\frac{1}{3}$	$73\frac{2}{3}$	80	68	9	$73\frac{2}{3}$	—	
March	71	$77\frac{2}{3}$	74	80	68	11	74	—	
April	73	80	$76\frac{1}{2}$	$83\frac{1}{2}$	69	10	$76\frac{2}{3}$	—	
May	$73\frac{1}{3}$	79	76	84	70	11	$76\frac{1}{3}$	—	
June	71	76	75	79	67	11	$74\frac{1}{2}$	—	
July	72	75	73	78	70	7	$73\frac{1}{3}$	—	
August	$70\frac{1}{2}$	75	70	80	67	9	72	—	
September	$70\frac{2}{3}$	$75\frac{2}{3}$	72	81	67	10	72	—	
October	70	75	$72\frac{1}{3}$	78	68	9	$72\frac{2}{3}$	—	
November	70	$75\frac{1}{3}$	$72\frac{2}{3}$	78	67	11	$72\frac{2}{3}$	$16\frac{9}{10}$	Mean Temperature $73^{\circ}\frac{2}{3}$.
December	$71\frac{1}{2}$	77	$73\frac{1}{3}$	80	68	10	$73\frac{1}{2}$	$12\frac{5}{10}$	

Annual Abstract of the Range of the Thermometer, from 1st *January to* 31st *December* 1818, *deduced from Observations made at the General Hospital, Kandy; together with an Account of the Quantity of Rain which fell.*

Months.	Medium Temperature, Morning.	Medium Temperature, Mid-day.	Medium Temperature, Night.	Highest Temperature.	Lowest.	Greatest Variation in 24 Hours.	Mean monthly Temperature.	Rain, Inches and Tenths.	
January	$67\frac{2}{3}$	$75\frac{1}{6}$	$71\frac{1}{2}$	80	60	15	72	2–5	
February	70	79	$73\frac{2}{3}$	81	62	15	74	1–0	
March	67	79	$70\frac{2}{3}$	82	61	19	$72\frac{2}{3}$	4–4	
April	67	$81\frac{1}{2}$	$70\frac{2}{3}$	84	64	20	71	5–2	
May	69	$82\frac{1}{2}$	72	84	63	21	$74\frac{1}{3}$	0–8	
June	$71\frac{1}{3}$	$78\frac{2}{3}$	$72\frac{1}{2}$	83	70	11	74	6–2	
July	$70\frac{1}{3}$	$78\frac{1}{5}$	72	82	66	12	$73\frac{1}{2}$	9–7	
August	70	77	$70\frac{1}{2}$	81	68	12	72	6–1	
September	$70\frac{1}{3}$	$75\frac{1}{3}$	$72\frac{2}{3}$	80	69	10	73	7–7	
October	70	$75\frac{1}{2}$	73	78	68	9	$72\frac{2}{3}$	15–4	
November	68	$75\frac{2}{3}$	$71\frac{1}{3}$	80	63	11	$71\frac{2}{3}$	9–8	
December	$67\frac{1}{4}$	76	$70\frac{1}{3}$	80	61	17	71	6–0	

Mean Temperature, $72^{\circ}\frac{1}{2}$.
Rain, $74\frac{8}{10}$.

Meteorological Abstract for the Year 1819, *deduced from Observations made at the General Hospital, Kandy.*

Months.	Mean Temperature, Morning.	Mean Temperature, Mid-day.	Mean Temperature, Night.	Highest Temperature during each Month.	Lowest ditto.	Greatest Variation in 24 Hours.	Monthly mean Temperature.	Quantity of Rain in Inches and Tenths.	
January	64 1/3	76	69 1/3	80	53	19	70	1-0	
February	65 2/3	78	70 1/3	84	57	22	71 1/3	0-4	
March	68	80 1/2	72 1/4	87	53	17	73 1/2	8-1	
April	68 2/3	80 1/2	72 1/2	87	63	18	74	11-7	
May	69 2/3	79	72	84	67	15	73 2/3	6-6	
June	69 1/2	78	72	83	68	15	73	2-3	
July	70 1/2	77	72	81	68	12	73	10-7	
August	71	78 2/3	72	84	68	15	74	3-5	
September	70	78	71 1/2	84	68	15	73	8-2	
October	69 1/3	79	72	83	65	15	73	6-1	
November	67 1/2	82	71	82	61	20	73	7-1	
December	68 1/2	76 2/3	70	82	64	17	72	18-6	

Mean Temperature 72° 3/4.
Quantity of Rain 84. 3.

Meteorological Abstract for the Year 1820, *deduced from Observations made at the General Hospital, Kandy.*

Months.	Thermometer.							Pluviometer.	Hygrometer. The Hygrometer is observed only once a Day, at about 2, P. M.		
	Mean Temperature, Morning.	Mean Temperature, Mid-day.	Mean Temperature, Night.	Highest Temperature during each Month.	Lowest ditto.	Greatest Variation in 24 Hours.	Monthly mean Temperature.	Quantity of Rain in Inches and Tenths.	Greatest Dryness observed during each Month.	Mean Dryness during each Month.	Least Dryness observed during each Month.
January	64½	76½	68½	80	56	19	70	10-0	—	—	—
February	67⅓	80½	71	83	62	19	73	3-8	—	—	—
March	67	82	72	86	58	28	73½	4-0	—	—	—
April	69⅔	84	72⅓	86	67	18	75⅓	7-1	—	—	—
May	71½	81⅔	74	89	69	18	75⅔	5-7	12	8	3
June	69⅓	78	72	82	68	10	73	14-4	8	5	1
July	70⅓	80⅔	72	87	68	17	74⅓	6-5	12	7½	4
August	70⅔	81	72⅔	87	68	18	75	4-4	13	8¼	3
September	70⅔	81	72	86	68	17	74⅔	5-7	13	8½	4
October	69½	83⅓	73	87	63	22	75	9-5	14	10⅓	5
November	69	83	70½	88	66	18	74	4-2	14	9⅔	4
December	68⅔	79	72	85	63	18	73	12-5	12	7⅓	2

Mean Temperature 73° $\frac{10}{12}$. Quantity of Rain 87—8.

The Hygrometer used is a small Thermometer adapted for measuring the temperature of the body. The bulb is covered with thin muslin, which is then moistened with water. In proportion as the mercury in the thermometer falls, the dryness of the air is indicated. The numbers imply degrees of Fahrenheit's scale.

Abstract of the Range of the Thermometer from 1st *December* 1808, *to* 30*th November* 1809; *deduced from Observations made at Fort Frederick, Trincomale, by Staff-surgeon* BATH.

Months.	Mean Temperature, Morning.	Mean Temperature, Mid-day.	Mean Temperature, Night.	Highest Temperature during each Month.	Lowest ditto.	Greatest Variation in 24 Hours.	Monthly mean Temperature.	
1808. December	76	$79\frac{1}{3}$	$77\frac{1}{4}$	82	74	7	$77\frac{1}{2}$	
1809. January	$75\frac{1}{2}$	$77\frac{1}{2}$	76	81	73	4	7	
—— February	$75\frac{2}{3}$	$79\frac{1}{2}$	77	82	74	5	78	
—— March	77	83	$79\frac{2}{3}$	86	75	8	80	
—— April	$79\frac{1}{2}$	$85\frac{2}{3}$	82	90	78	9	82	
—— May	$79\frac{3}{4}$	88	82	90	77	10	$83\frac{1}{3}$	
—— June	$79\frac{1}{2}$	$89\frac{1}{3}$	$82\frac{2}{3}$	$90\frac{1}{2}$	78	10	84	
—— July	79	88	81	90	75	10	$82\frac{2}{3}$	
—— August	$78\frac{1}{2}$	87	81	90	76	11	82	
—— September	78	$87\frac{1}{3}$	80	90	76	11	82	
—— October	$76\frac{1}{2}$	83	$78\frac{1}{3}$	90	74	12	$79\frac{1}{3}$	
—— November	$75\frac{2}{3}$	$80\frac{1}{2}$	78	84	73	9	78	

Mean Temperature $80°\frac{5}{12}$.

Abstract of the Range of the Thermometer, from 1st *December* 1809, *to* 30*th November* 1810; *deduced from Observations made at Fort Frederick, Trincomale, by Staff-surgeon* BATH.

Months.	Mean Temperature, Morning.	Mean Temperature, Mid-day.	Mean Temperature, Night.	Highest Temperature during each Month.	Lowest ditto.	Greatest Variation in 24 Hours.	Monthly mean Temperature.	
1809. December	$75\frac{2}{3}$	$79\frac{1}{3}$	77	81	73	7	$77\frac{1}{4}$	Mean Temperature $80°\frac{9}{12}$.
1810. January	$75\frac{1}{2}$	$79\frac{2}{3}$	$76\frac{1}{3}$	81	72	6	77	
—— February	74	87	77	82	72	7	$79\frac{2}{3}$	
—— March	78	$83\frac{1}{2}$	79	86	75	6	$80\frac{1}{2}$	
—— April	$80\frac{2}{3}$	$86\frac{1}{3}$	83	89	79	8	$83\frac{1}{3}$	
—— May	82	$86\frac{1}{3}$	$82\frac{1}{2}$	92	75	10	83	
—— June	79	88	$81\frac{2}{3}$	93	76	12	83	
—— July	79	$84\frac{1}{3}$	82	91	78	10	82	
—— August	78	85	$79\frac{1}{2}$	90	76	10	81	
—— September	79	$87\frac{1}{2}$	82	90	77	11	83	
—— October	$77\frac{1}{2}$	$83\frac{1}{2}$	$79\frac{1}{8}$	86	75	8	$79\frac{2}{3}$	
—— November	$77\frac{2}{3}$	82	79	85	74	6	$79\frac{2}{3}$	

According to the above data, the medium temperature of the town of Kandy is about 73° 1′
And that of Fort Frederick, Trincomale 80° 5′
Difference 7° 4′

Which is about one degree of decreased temperature for every 200 feet of elevation.

The medium annual quantity of rain which fell in Kandy, according to the observation of three years, is 82 inches $\frac{3}{10}$.

The indigenous vegetable productions of Ceylon are numerous, and extremely luxuriant. The vast number of parasitical plants arrests in a particular manner the attention of strangers. This class of plants is disseminated by means of wild pigeons, and other birds, who devour the fruit. The seeds pass through the intestines without losing their prolific qualities, and are frequently dropped into clefts between the branches of trees; germination succeeds, and eventually the tree assumes a most anomalous appearance; namely, one trunk supporting and nourishing a number of plants with a great variety of foliage. Many of the plants, thus sown, are of that kind which shoot forth long tendrils: the tendrils soon reach the earth, and there take root. In a short time the tree becomes covered to the ground with a mantle of dense vegetation, which is in many instances studded with the flowers of a great variety of annual creepers. In this manner the trees become united together to a great extent, forming a vegetable covering through which the rays of the sun cannot penetrate. Where the trees are tall, the descending tendrils of the parasitical plants twine round one another, and form cord-like aggregations before they reach the earth. In progress of time these bunches of tendrils assume the size of small cables; and, as they enter the ground at some distance from the root of the tree, they resemble the standing rigging of a large ship. The length of the ground rattans is another remarkable instance of exuberant vegetation; they are often found extending in length from two hundred to four hundred feet.

Rice is the chief indigenous culinary plant which is cultivated. The Kandyans likewise cultivate coracan (cynosurus corrocanus) and sweet potatoes. Coracan is for the most part sown upon the sides of hills, although it grows upon low as well as upon high grounds. It is considered an inferior food to rice, and is chiefly used by the poorest of the people.

The Kandyan country yields the common tropical fruits, such as pampelmus, oranges, limes, the papaw fruit, custard-

apples, &c.; but the inhabitants very rarely cultivate them. Plantains, cocoa-nuts, and jack, are almost the only fruits which the inhabitants endeavour to raise.

Since the country has been occupied by British troops, many attempts have been made to introduce the cultivation of common garden vegetables: hitherto the attempts have but very partially succeeded: this failure arises in part from the difficulty of procuring prolific seeds from England. Very few of the native plants of high latitudes bear fecund seeds, even in the most alpine parts of Ceylon. The pea is almost the only exotic which has hitherto produced ripe seeds.

The chief domestic animals of the Kandyans are black cattle and buffaloes. The former are much employed to bear burdens; the latter are chiefly used for drawing the plough. Dogs are allowed to breed about their houses, but little or no attention is paid them. A Kandyan is never seen accompanied by a dog. Some of the inhabitants breed common fowls; but this practice is not general: it is almost confined to the Moors or Musselmen, who reside in the interior. Sheep, goats, ducks, and cats are not domesticated by the Kandyans. A very few of the chiefs have horses: they are solely used for the saddle.

Bulls are castrated by compressing the testicles between two pieces of wood. Castration is in general not performed until the animal be about three or four years of age. By this operation the texture of the gland appears to be completely destroyed: inflammation and swelling follow the compression; eventually the substance of the testicles seems to be absorbed. According to report, death rarely follows this rude operation.

Black cattle are sometimes subject to an extensive and devastating murrain: there was one in 1806 and 1807, and another in 1815 and 1816; the latter was more severely felt towards the northern than the southern extremity of the island.

The origin of the disease is involved in great obscurity;

whether it be contagious or not, my information does not enable me to decide. The symptoms were, a drooping and unhealthy appearance of the animal, hanging down of the head, swelling about the eyes, mouth, and throat, quick respiration, rattling of the throat, unsteadiness in walking, great discharge of fluid from the eyes, ulcers about the mouth and nose, and impaired appetite: towards the advanced period of the disease, purging supervened. I inspected one body after death, and did not discover any remarkable structural derangement.

At the same time, when the murrain was destroying great numbers of black cattle, a dreadfully fatal disease prevailed among the wild elephants, hogs, deer, and elks. In some places of the Batticaloe district, where wild hog abound, the bodies of several hundreds of these animals were occasionally found collected within a very limited space.

Cows from England do not thrive in Ceylon; the few, at least, which have been imported, in general, soon drooped and became sickly.

Horses are more liable to disease than in England, particularly to inflammation of the bowels. Their power of sustaining fatigue is much less than in cold countries: they are not deemed capable of enduring above one half the labour that horses usually perform in high latitudes.

Dogs, particularly greyhounds, do not bear removal from England to this country; in general they soon droop and die: many expire during the first year after they arrive, and few outlive the second. The lungs and liver are the organs which chiefly suffer in this class of animals. The progeny of imported dogs are likewise extremely liable to disease, and difficult to rear. Dogs of the native breed are hardy and very prolific.

Poultry, including turkeys, geese, ducks, and common fowls, are occasionally liable to disease, which carries off great numbers of them. The disease is sometimes confined to turkeys and common fowls; at other times geese and ducks

are also affected. Nothing is known respecting the nature of this malady; the animals which are seized generally die suddenly. Dissection has hitherto thrown no light upon the proximate cause of the disease; we are equally ignorant of the remote cause, and how far certain states of the air occasion the mortality. The disease prevails in hot dry weather as well as during the existence of a moist cool atmosphere.

There is a small but very troublesome species of leech in Ceylon: perhaps it is the hirudo geometra of Linneus. They seldom stretch themselves above from one to two inches; they are amber-coloured both on the belly and back, and thickly sprinkled with black spots. On each side they have a yellow line along their whole length; and another line, of the same colour, upon the back. They fix themselves upon an object by the tail, and can extend the head and body either vertically or horizontally. They move by pushing the head and body forwards, and then bringing up the tail, thereby forming an acute arch.

Leeches of this species are found chiefly on the uplands: they are seldom observed on the flat country below the hills; wet grass is their most frequent abode. They are very numerous among the decaying leaves in close jungles. The passes to the hills and places shaded by large forest trees seem to be particularly suitable to them. I never saw any of them in ponds or rivers. When put into water they lose their usual activity and become torpid. These little animals are frequently very annoying; it is hardly possible to prevent them from coming in contact with the skin. Notwithstanding much care to exclude them, travellers are frequently, during moist weather, liable to be bitten by great numbers of them. I have known eighty taken from one individual.

Of snakes there is a considerable variety in Ceylon; some of them are extremely large. Two species are known to be very venomous, namely, the cobra capelle and the polonga. Accidents from the bites of these snakes happen but rarely. I have never seen a person suffering under the influence of

the poison of a snake. Mr. Maitland, the superintendent of Cinnamon plantation, assures me, that of the number of people employed in the cultivation and propagation of cinnamon, the death of only one man by the bite of a snake has been reported since a British force occupied the island. This accident happened at the Kaderane plantation. The number of people belonging to the cinnamon department, employed in the plantations and jungles, is seldom less than two thousand. This fact is mentioned for the purpose of showing that fatal accidents seldom happen from the bites of snakes in Ceylon.

CHAPTER II.

Character, Habits, and Customs of the Kandyans—Food—Clothing——Dwellings——Occupations—Population—Veddahs.

The Kandyans, both male and female, particularly those of the higher classes, are remarkably well made: compared with Europeans, they have short necks. In other respects they are extremely well proportioned, and many of them possess the most perfect symmetry of shape. They are hardy, and capable of enduring considerable fatigue. Deformed persons are very rarely seen.

In their external manners they are mild, grave, and remarkable for a ceremonious politeness to superiors. The upper classes in particular evince, on all occasions, a strict sense of decorum and exterior decency of manner. When they approach a person in authority, or one whose influence they appreciate highly, they are extremely obsequious, and often voluntarily debase themselves, in actions as well as in the tenour of their address. They seem always to have complete possession of themselves, and rarely appear at a loss how to act. In their intercourse with strangers they evince an easy confidence, and never display diffidence or bashfulness. They are prone to flattery, and frequently display no mean degree of ingenuity in thus courting the favour of those above them in rank and influence.

The Kandyans are by no means deficient in intellect: the young seem to be endowed with an early maturity of the faculties of the mind. The mental powers are, however, greatly contracted and repressed by the influence of early habits and deep-rooted prejudices.

They rarely display much mental emotion; they very seldom show any warmth of affection, never an impetuosity

of temper. Of the affections which owe their origin to self-love, the Kandyans are chiefly influenced by vanity and fear: the former appears to be their ruling passion. They possess none of the social affections, no benevolence of disposition; they are neither hospitable nor compassionate. They regard the misfortunes of others with a remarkable degree of indifference. Although they in general seem little disposed openly to injure their neighbours, they display no pity towards the unfortunate. They rarely commit great crimes, yet they are not a virtuous people.

The moral sense has been very little cultivated among them: they are rarely impressed with a just perception of right and wrong. They are great adepts in simulation and dissimulation; fraud has become a custom of the country; and lying, when that vice promises to be useful, is a universal propensity. They are so accustomed to artifice, that, in courts of law, they often injure a good cause by fraudulently attempting to increase their claims. Unfortunately, dishonesty and lying do not entail disgrace upon the perpetrators: they seem insensible to the sensation of shame.

To Europeans the manners of the Kandyans present many points of great inconsistency. They are polite, but hardly pretend to be sincere. They assume a dignity of manner, and yet do not hesitate to perform mean low-minded actions. With an exterior deportment which is grave and serious, their minds appear to be, for the most part, engaged about some unimportant or trifling subject.

Females are kept in a dreadful state of degradation: they seem to be considered as mere household property. The men often speak of them as if they belonged to an inferior class of animals. Under such a state of society, is it surprising that female virtue is unknown?

Women are not permitted to eat in the company of the men. Some classes of them are not allowed to cover their bosoms. Notwithstanding these important distinctions between the sexes, the control of the males over the females is

tempered with mildness; it is the mildness, however, of indifference and scorn towards an object of little value.

They have no term in their language synonymous to our word wife. The repudiation of women who have lived under the protection of males is frequent, and often takes place without an assignable moral defect: loss of youth, and sterility, are occasionally brought forward as the causes of divorce.

The custom of two or three brothers living with one woman is not unfrequent *. The common feelings of the people rather approve than disapprove of such connexions. A poor man thinks he disposes of his daughter to great advantage if he obtains the protection of two or three brothers for her. This confederation is more frequent among the poor and the indigent than among the wealthy. Inadequate means for supporting a family is the reason assigned by the poor for associations of this kind. The comparatively rich profess to follow this practice for the purpose of preventing too great a division of property.

Lands were in general held by a tenure of personal service, which was to be rendered to the king, to the temples, or to the local chiefs. This mode of holding lands is now much modified: personal service is commuted into a portion of the crop, when such a commutation is favourable to Government. Intestate estates devolve in equal proportion upon the males and unmarried females of a family. A bride must carry her dowry with her to the bridegroom. When a young woman leaves her father's house, she has no farther claim of inheritance upon his property.

The progeny of brothers are considered in the light of brothers and sisters, and do not intermarry. Cousins, being the children of a brother and a sister, may marry.

Property in land is much divided. There are almost no extensive landholders in the country. A very great proportion

* I have lately learned, that the practice of several males living with one woman is not confined to brothers; two or three men, unconnected by relationship, sometimes form copartnerships of this kind.

of the inhabitants have individually a small portion of land of their own, or are intimately connected with those who have: on this account there are not many who gain a livelihood by hiring themselves to others, and there are but few common beggars.

The Kandyans are remarkably superstitious and rigid observers of what they consider lucky and unlucky days. When a child is born, an astrologer is consulted to predict its future destiny. Should the astrologer foretel an unhappy fate to the infant, it is greatly neglected: the parents frequently give it to any person who will accept such a present. In some parts of the country unlucky infants, particularly females, are exposed in the jungle. Children born in an evil hour are supposed to bring misfortunes upon the parents, if they continue to nurse them.

After death, the bodies of the priests and the principal chiefs are burned upon a funeral pile. Small mounds of earth cover the ashes. In other respects the Kandyans are, to a surprising degree, neglectful of the remains of their deceased relations. The dead are, for the most part, buried in the jungle by the relations. They neither raise a tomb to their memory, nor visit the spot where the bodies of any of their relations happen to have been interred.

Domestic slavery existed to a considerable degree among the Kandyans, under the government of their kings: it is still tolerated by the colonial government. For particular crimes, the late king sometimes sentenced the perpetrators to perpetual slavery. A parent might mortgage or sell his children; by this means many slaves were created: creditors might take possession of the children of their debtors.

The Kandyans are not industrious; or rather they are not enterprising. Many circumstances, however, combine to check a spirit of activity, and to retard a more assiduous application in the cultivation of the soil. Like the natives of India in general, the Kandyans have few impelling motives to active industry: their chief want is a little rice. The

mildness of the climate renders a substantial house not essentially necessary. By means of a few bamboos and talipot leaves, a Kandyan can construct a habitation which suffices to shelter him from the sun by day and the dews by night. He requires no bed-clothes: the cloth which he wears round his loins by day is the only covering he adopts during night. He is at no expense for furniture; and, except a few earthen vessels, he uses no culinary utensils. Fashion has no influence in this country; the fixed habits of the people in regard to food, dress, ornaments, &c. prevent the expense which might be incurred were they to indulge in a love of change in the manner of living.

Other circumstances may likewise be mentioned as tending to check the industry of the Kandyans. The chief of these seems to have been insecurity of property. Under the native government, they were liable to be plundered by the chiefs, and sometimes by the direct orders of the king himself. The chiefs frequently purchased their offices, and held them always at the pleasure of an arbitrary despot. The uncertainty of their situation caused them to lose no time in oppressing and pillaging the people under their control. The immediate consequences of oppression occasion much misery, and the habits it generates among a people perpetuate the causes of penury and want.

The education of the Kandyans is extremely limited. Parents in comparatively good circumstances teach the boys of the family to read and write their own language, although in general very imperfectly. This is, however, the extent of their acquirements. The Singhalese books relate chiefly to the exploits of Buddha and his followers, and the opinions of the ancients regarding medicine and astrology. There is not a book in the Singhalese language that has a tendency to expand the mind and to improve the thinking faculty: the attainments of the ancients being considered beyond the reach of the moderns, a check is by this means put to all attempts to improve upon their writings, or to exceed them in information. Even

the more learned of the Kandyans are quite satisfied if they can comprehend the books they read. The teachers explain to their pupils the books they have heard expounded, and in the exact manner it had been done to them. Improvement is never contemplated; they supply no omission and expose no defect. The fables of the ancients obtain implicit belief, however absurd they may be, and the people can conceive nothing superior to them.

The females receive no education. The woman who lives with a man as his wife prepares his food and stands by at a respectful distance while he eats his meal: what remains after he is satisfied, becomes her portion. For want of cultivation, the female mind is involved in the greatest darkness.

The crime of murder is occasionally committed among the Kandyans; robbery is generally the ultimate intention of the perpetrators. Disputes regarding the right of inheritance sometimes lead to murder. A circumstance of a very different kind causes, likewise, the committal of this crime. Should a female have sexual connexion with a man of a caste inferior to her own, her relations consider themselves thereby disgraced: the disgrace is equally great, whether the act was voluntary or not on the part of the woman; to wipe off the stain, her blood must be spilt: the relations assemble, and deliberately murder her. By immolating the poor woman her relations consider the disgrace which attached to them removed. An instance of this kind took place in 1820, in the province of Saffragam. A Rodiah had forcible connexion with a female of a superior caste. The Rodiah caste is the lowest in the Kandyan country. The woman informed her relations of what had happened: they were instantly thrown into great distress, on account of the disgrace her misfortune had occasioned: to cause their unhappiness appeared to be the sole motive of the wretch in having connexion with the woman. The relations assembled, and decreed the fate of the innocent cause of the stain which had been cast upon their family. With great reluctance on the part of the poor woman, she was led to the

neighbourhood of the residence of the Rodiah who had injured her, and there stabbed to the heart by her uncle; he at the same time calling out that the disgrace of his family and relations was now removed. The people concerned in the murder were well aware of the consequences of the crime they had committed. They were shortly after tried, and condemned to suffer death; on mature deliberation, the culprits were respited. The murder, however barbarous in its nature, was committed in compliance with the absurd manners of the country, not with the malicious intention of destroying the woman to gratify some malignant passion. Laws which are inconsistent with the habits and customs of a people are seldom strictly observed.

Many cases of suicide have come to the knowledge of the different courts of law in the Kandyan country since they were established. Females as well as males sometimes commit this crime. Suicide, when it occurs, is, for the most part, a consequence of some domestic or village broil. The person who thinks himself injured sometimes retires precipitately, and suspends himself from a tree. Hanging is the manner by which suicide is generally committed. Vengeance is the probable cause for the commission of this crime. Under the native government, the person with whom the defunct had quarrelled was severely fined by the chiefs. For this purpose it appears that suicide is in general perpetrated. Some instances have occurred where persons labouring under a painful disease have committed suicide, seemingly with the sole view of relieving themselves from the existing source of uneasiness.

The Kandyans profess to follow the tenets of Buddha.—This religion is a system of mere external ceremony. It is chiefly directed to the eye, and relates more to manners than to the ties of religion: Buddhism neither affects the heart nor influences the conduct. The chief business of the priests of Buddha appears to be to attend at the temples consecrated to him, for the purpose of spreading flowers before his image. They have a morning and evening service, or formula, which

they repeat; but it does not appear that these acts of external worship deserve the name of prayer. The form of their worship is not congregational. The ceremonies of Buddhism are for the most part accompanied by noisy and very discordant music: loud, harsh, squeaking pipes, conch-shells, and a variety of tom-toms (drums), are the instruments chiefly used on these occasions.

Being abject slaves to the belief of the influence of evil spirits, the Kandyans in general make oblations to the malign spirits, and carry charms about their persons, with the view of averting disease and evil of all kinds.

Dwellings.—The town of Kandy excepted, there was not an assemblage of houses in the Kandyan provinces that deserved the name of a village when our troops took possession of the country in 1815. Adjoining to the different military posts, small collections of huts are now formed. These huts are, however, chiefly occupied by petty traders from the maritime provinces.

The cottages of the inhabitants of all ranks are built of mud, and thatched with paddy straw. They are, for the most part, extremely confined, and destitute of comfort. The door of the hut is in general remarkably small, and it rarely has any other opening. The huts are usually embowered in trees and jungle, and are situated at a considerable distance from one another: for the most part, they stand close to the margin, and a little elevated above the narrow valleys which are cultivated with rice. In some parts of the country the huts are constructed upon a precipice or difficultly accessible spot on a hill, which is chosen as a place of refuge from the rude visits of elephants. Each hut is surrounded by a number of fruit-trees and shrubs, of which the cocoa-nut, areca, jack, plantain, and Cayenne pepper, are the most common. No care is in general taken to increase the cultivation of fruit-bearing plants, beyond the probable consumption of the family.

Food.—Rice is the substantial part of the food of all

classes of Kandyans. In respect to the quality of the aliment, there is little distinction between that used by one rank from that of another. The rice is dressed and eaten with succulent vegetables and spicy condiments: ghee (clarified butter), or an oily emulsion procured from the kernel of the cocoa-nut, is usually added to the dressed rice. This kind of food is called *malu*, a term nearly synonymous with the word curry. On some occasions they eat animal food: they rarely, however, eat the flesh of any animal but wild hog, deer, and common fowls. They likewise drink milk. They make butter, which is converted into ghee before it is used. With cheese they are unacquainted. They eat three times a-day, and universally help themselves with their fingers. For drink they use pure water: they do not drink coffee, although the plant grows wild in the jungles that surround their huts.

Clothing.—In regard to clothing, the Kandyans are remarkably simple. The lower and middling classes of men wear round their loins a piece of cotton cloth which reaches to about the knee, and a handkerchief or strip of cloth round their head. The upper part of the body and the feet and legs are quite bare. The females of these classes wear a piece of cloth round their loins, which descends to a little below the knee. On particular occasions, such as travelling along a public path, they throw a small piece of loose cloth over their shoulders, so as partially to cover the chest. The ordinary ornaments of Kandyan females of the lower class are a small portion of the talipot leaf, rolled up and inserted into an orifice made in the pendulous part of the external ear, and bracelets made of a large sea-shell.

The higher class of males wear chintz cloths round their loins, and, on particular occasions, a kind of jacket of silk stuff. The greater the quantity of cloth which is wrapped round the middle, the greater is supposed to be the wealth and importance of the wearer. They have a light covering for the head, which is so constructed as to indicate their respective ranks. Females of the upper classes wear painted

chintz cloths, which reach near to the ankles. A portion of the cloth which encircles the loins is made to cover the chest. On days of ceremony they dress in a cotton jacket with a kind of tippet, which hangs over the shoulders. For ornaments they wear beads round their necks, golden trinkets in the ears, and bracelets on their arms.

Occupations.—The Kandyans are all agriculturists; farming is the chief business of the entire population. Land being greatly subdivided, almost every individual has a small portion. There are no great landholders, and, consequently, there is little or no superfluous produce; except the small quantity of food required by his family, the Kandyan rarely gives himself any concern to raise more. He seldom endeavours to improve his circumstances by increased application or a more extended cultivation of the soil. He is generally quite satisfied when he has tilled the field which his forefathers had done. The mode of cultivation is never altered. Their chief concern is to obtain a small store of food. When a Kandyan possesses rice, his wants in that respect are supplied; he cultivates almost nothing for the market. In general the Kandyans are extremely poor; many of them are indigent: they are, however, for the most part, unwilling to labour for hire, such is the effect of long-established habits. When circumstances place money in their power, it is hoarded and concealed under-ground.

The attention of the Kandyan peasant is almost exclusively directed to the cultivation of rice. In this part of farming he undoubtedly excels. The soil is prepared for the seed by the hoe, the feet of buffaloes, and sometimes by a small kind of plough. During preparation the soil is universally inundated. Land in general yields two crops annually. The seasons are but little attended to, except in so far as a supply of water for irrigation is concerned. The fields are all subdivided by ridges, and in a greater or less degree terraced, that an equal supply of moisture to the whole may be

afforded. Nothing can excel the neatness of a rice-field under crop.

Each field must be watched during night, to prevent the destructive inroads of wild beasts, namely, wild hog, elephants, deer, elk, hares, &c. The ripe crop is cut with sickles, and the grain trodden out by buffaloes. On the margin, sometimes towards the centre of a field under crop, the cultivator erects a little shed, where the person who watches shelters himself. This watch-house is very frequently constructed among the boughs of a tree. The watchman is sometimes furnished with a musket, and sometimes only with a rattle, for the purpose of deterring the wild animals from approaching the field. Much vigilance is generally required on the part of the watchman, as the irruption of a herd of elephants would greatly injure a crop of rice. It will therefore appear that the nature of the agriculture of the Kandyans exposes them much to the exhalations which arise from a miry soil, and to frequent vicissitudes of temperature, particularly to the cold dews of night.

Oppression and insecurity of property, the too frequent results of an arbitrary government, may have quenched the natural tendency of mankind towards improvement, and reduced the Kandyans to the semi-barbarous state in which we found them. Under the king's government they were bound to perform personal service on account of grants and advantages of a very indefinite nature. Personal servitude is, of all taxes, the most odious to the subject, and the least profitable to the government: it has a direct tendency to retard the melioration of a people. To a certain degree, personal servitude is continued by the colonial government, and the extent to which the services of some classes of the people may be claimed is nearly as unfixed as ever.

During the native control, the chief business of the officers of government was to plunder the people and deceive the king. All ranks were mercenary to the highest degree. The greatest oppression that can be imagined was committed

under the veil of receiving presents: the king enforced the delivery of presents from the superior chiefs into his stores; each rank in succession acted in a similar manner; the poor had literally nothing that they could call their own. The chiefs of districts purchased their appointments by presents to the king or his satellites; subordinate situations were obtained in the same manner from the chiefs of provinces: the holders of appointments were frequently changed for the purpose of extracting a greater portion of the substance of the inferior classes. To obtain an appointment under government was to receive a license to oppress the people. No person expected to obtain a verdict in a native court from the justice of his cause: decisions were supposed to be given in proportion to the value of a bribe, or according to the power of some sinister influence; hence both the plaintiff and defendant endeavoured to corrupt the judge. An unprincipled love of rapacity is still universal among the chiefs. A long period must elapse before a mild government will succeed in arresting the consequences of this disposition. Already, however, the lower classes in some districts evince less of that timorous submission to the wishes of the chiefs than they formerly did.

Return of the Population, &c. of the Kandyan Provinces. The Numbers (except in the Districts of Matale and the Eastern Division of Nuwerakalawiya) were ascertained by actual Enumeration: the Extent in square Miles was calculated from Atkinson's Map of the Island.

		Number of Gammas or small Valleys capable of Cultivation.	Population. Males.	Population. Females.	Total.	Proportion of Females to 100 Males.	Square Miles.	Number of Inhabitants in each square Mile.	
Districts on the Terrace.	Town of Kandy	—	1554	1376	2930	88½	46	120	Exclusive of the Town of Kandy, which is situated in Yattinoowera.
	Suburbs of Kandy within the River	—	882	797	1679	90⅓			
	Yattinoowera	60	2000	1864	3864	93⅕			
	Haresiyapattoo	128	3192	3350	6542	104	50	130	
	Toompanē	57	2344	1934	4278	82	70	61	
	Hēwāhetta	90	4510	2764	7274	61	160	45	
	Walapanē	21	829	779	1608	93¼	630	2½	
	Udunoowera	74	2495	2362	4847	95½	42	115½	
	Udapalātā	47	1319	1031	2350	78	608	7⅙	
	Upper Bulatgama	8	345	264	609	76			
	Kotmalē	39	825	575	1400	69			
	Doombara	80	3600	6929	15529	80½	468	33	
	Oowa — Upper Division	48	387	277	664	71¼	350	9⅔	
	Oowa — Middle Division	143	1540	1189	2729	77¼			
	Weyaloowe	114	433	388	821	87	36	23	
Districts below the Hills. — Districts towards the West and South of the Terrace.	Nuwerakalawiya (Western Half)	394	2997	2626	5623	90	462	12	
	7 Korles — Upper Division	547	10560	9714	20274	90	3010	26⅔	
	7 Korles — Lower Division	1663	32831	27405	60236	83			
	3 Korles and Lower Bulatgama	126	4829	3580	8409	72	1040	47	
	4 Korles	339	22552	18001	40553	80			
	Saffragam	—	10572	10487	21059	99	1572	14	
Districts towards the East and North of the Terrace.	Matalē	—	—	—	15900[a]	—	1060	15	[a] By estimation.
	Nuwerakalawiya (Eastern Half)	—	—	—	9660[b]	—	1380	7	[b] By estimation.
	Tamankada	80	1147	880	2027	76	1129	1⅔	
	Bintenna	78	942	523	1465	55½	320	4¼	
	Vellasse	115	2900	2356	5256	81¼	364	14⅓	
	Oowa (Lower Division)	297	3327	2641	5968	79	1125	5¼	

Population of the Kandyan Provinces per square Mile	18.2
Ditto of the Districts on the Terrace, per ditto	23.2
Ditto of the Districts below the Hills, per ditto	16.2
Ditto of the Districts below the Hills, to the West and South of the Terrace, per ditto	25.6
Ditto of the Districts below the Hills to the East and North of the Terrace, per ditto	7.4
Proportion of Females to 100 Males, exclusively of the Districts of Matelé and the eastern Division of Nuwerakalawiya	84
Total Amount of the Population of the Kandian Provinces	253,554

The enumeration of the inhabitants of the Kandyan provinces was made in consequence of orders for that purpose having been issued by the colonial government. The business was conducted by native chiefs, under the superintendence of the civil servants and accredited agents of Government employed in the respective districts. The district returns were transmitted to Simon Sawers, Esq. Commissioner of Revenue in the Kandyan country; who, with his usual liberality and kindness, permitted me to examine the elementary documents, from which I compiled the above return.

In common language the Singhalese *gamma* is generally translated village. This term, however, conveys a false idea to Europeans: the word *gamma*, in its proper sense, designates a valley or several small valleys, capable of being cultivated with rice, together with the inhabitants who subsist by the cultivation of this tract. The huts are constructed on the margin of the field, and in general they stand widely apart from one another. There are, therefore, no congregations of huts which can be denominated a village. Each *gamma* has a small municipal establishment, consisting of from one to four petty chiefs, according to the number of the inhabitants. Some *gammas* have not more than two or three families; others contain as many as thirty. Many small valleys that

obtain the name of *gammas* are at present entirely without inhabitants.

The population of the different districts is, it is presumed, tolerably correct: being the first attempt to number the people, some inaccuracy may however be expected.

The small proportion of females to males (84 to 100) is a very remarkable circumstance. Many motives exist among the people which might induce the males to evade enumeration; no cause is, however, known that could occasion an omission of females. In England the proportion of females to males is 98.8 to 100. To what, then, are we to attribute the great difference in this respect between the Kandyan provinces and Great Britain? It may be feared that the disproportion is in part owing to the occasional murder of female infants. The father of the new-born babe either carries or sends the little innocent to the jungle, and there abandons it; in general, the poor infant soon dies from cold, or it is devoured by wild beasts. This practice is known to obtain in some parts of the country, particularly in those districts where want, indigence, and disease greatly prevail. In these insalubrious and uncultivated tracts, the poverty of the inhabitants is often extreme; and this circumstance is sometimes assigned as an excuse for female infanticide. It has been observed, in the districts where this practice prevails, that more than one female child is rarely to be found in a family. Superstition lends her aid to promote child-murder. The chances of the life of each infant being foretold at birth, it becomes the interest of the fortune-teller to ascertain the views of the male parent (for the mother is rarely consulted) in regard to the preservation of his offspring. Infants whose lot in life is predicted to be unlucky, are generally neglected, and often exposed. According to the information I have been able to collect on this subject, it appears that male infants are rarely considered to have an irretrievably bad fortune; neither are

* See the Census of 1811.

the first-born female infants of a family. The female infants that follow are said to be often considered unfortunate, and sometimes suffer the immediate consequences of such a prediction. The people talk of the exposure of infants as not an uncommon circumstance, and without appearing to attach the slightest shade of culpability to the unnatural act. Still, however, it is done with some degree of privacy, and individuals seem unwilling to admit that they have thus treated their own infants. Under the native government, the exposure of infants was prohibited: the king's mandate had, however, little influence in restraining the practice, particularly in the districts distant from Kandy. To what extent infant murder now obtains, it is impossible to conjecture; but it is to be hoped Government will endeavour to put a stop to such a horrid practice.

Veddahs.—Some of the thick forests which lie below the hills towards the east of the terrace, more particularly the almost impenetrable woods of the province of Bintenna, are inhabited by a singular race of people, called Veddahs (hunters). There are two classes of this people: one class is called the jungle, or wild Veddah; the other is in some degree civilized.

During the year 1817, a party of eight or ten of the latter class arrived in Kandy, bringing with them a portion of honey as a tribute to Government. They were each furnished with a peeled rod of six or seven feet long, which was used as a walking-stick. In stature they did not differ much from the ordinary natives. Their beards were uncut; the hair of the head was long, and hung in matted tufts over the face, as well as backwards over the shoulders. Their general appearance was savage and uncouth. The parts of generation were covered with a narrow strip of cloth, which was suspended from a string tied round the loins. The half-civilized Veddahs have a fixed residence; they cultivate a small quantity of Indian corn and natchenny; they associate a little with their Kandyan neighbours, and they acknowledge the authority of the petty officers appointed by Government. In all other re-

spects the habits of this class are not much different from those of the jungle Veddahs.

From this party of half-civilized Veddahs the following facts, regarding the jungle Veddahs, were chiefly obtained. Their statement has, however, been confirmed by other sources of information.

The jungle Veddahs are said to be less in stature than the neighbouring inhabitants. They are extremely active. They permit the hair of the head to hang over their faces, and they do not shave. The parts of generation are covered with a strip of cloth, only a few inches wide. The cloth of some of the women is said to be larger than that of the men; but many women have no covering of any kind. A jungle Veddah rarely emerges from the forest which he inhabits. He carefully shuns intimate intercourse with the settled inhabitants. I am not aware that a wild Veddah has ever been seen by a European.

Individuals of this class have no fixed residence: sometimes they pass the night on a tree. Occasionally, however, they construct temporary huts with branches of trees and long grass. Their furniture consists of one or two earthen pots, a calabash, and a small basket lined with leaves, in which they keep their honey. Each male Veddah in general possesses a bow and about six arrows. Dogs and buffaloes are the only animals domesticated by the Veddahs. The former they train to assist them in hunting; the latter are solely used for the purpose of enabling them to approach wild animals. The buffaloe is taught to move in whatever direction the Veddah wishes. By keeping close under cover of the buffaloe, the Veddah approximates his prey unperceived.

Hunting is the sole occupation of the Veddahs: deer is their favourite game. They however kill elk, wild hog, monkeys, and guanas, and eat their flesh. It is said they occasionally attack and kill elephants. They never attack elephants but for the sake of their tusks: elephants with tusks are rare in Ceylon. They dispose of the tusks by barter.

The Veddah aims at a certain part of the head of the animal, where the cranium is thin and can be penetrated by an arrow.

When in want of arrow-heads (that part of the arrow which is made of iron), a Veddah proceeds by stealth to the neighbourhood of a blacksmith's house, and there hangs upon a tree a quantity of honey, or dried deer's flesh; he at the same time signifies, by marks known to the blacksmith, the shape and number of the arrows he requires in return for the articles he has furnished. The blacksmith suspends the arrows upon the same tree where the honey or deer's flesh was found; and the Veddah watches some favourable opportunity to remove them without being noticed.

The Veddahs subsist chiefly on the flesh of the animals which they kill. The flesh of animals recently killed they dress by boiling it in an earthen vessel, or by broiling it over a fire. That part of their prey which is not immediately consumed they divide into thin portions and dry in the sun. Dried flesh is not cooked; the pieces are covered with honey and eaten raw. Whenever a Veddah possesses a small store of food, he does nothing but sleep and eat. The immediate calls of hunger are necessary to impel him to resume his search after prey. Sometimes the Veddahs fail in obtaining a supply of animal food: they are then obliged to subsist on a variety of substances, such as spontaneous esculent roots, the kernels of the sago-palm, wild fruits of various kinds, honey, &c. Although the sago-palm abounds in the forests frequented by the Veddahs, they have not acquired the art of extracting the sago from the trunk of the tree. It is the business of the females to collect the vegetable articles of diet. When hunger presses hard upon a Veddah, he has sometimes recourse to a singular mode of allaying his appetite. He collects the rotten and decayed branches of some particular trees, which he grinds and mixes with a little honey. This mixture he eats when more nutritious food cannot be procured. Honey is much used by the Veddahs as an article of diet. When they fail in procuring salt, by barter, from their more

civilized neighbours, it is customary with them to collect the leaves of particular trees, and to reduce them to ashes. By this means a bitterish salt is procured, which is used as a substitute for common salt.

The Veddahs are said to be hospitable and kind to strangers. To escape the persecution of the kings of Kandy, many of their subjects have from time to time fled to the Veddah forests, where they always found a kind welcome and a safe place of refuge. The priest who set himself up for a king, in 1817, and who occasioned the insurrection of that and the following year, is supposed to be now under the protection of the Veddahs. All the means which promised to be useful have been tried to induce them to give him up to Government, but hitherto they have failed. Rewards of great magnitude have been offered to any of the Veddahs who will secure him; but all without effect.

A Veddah has in general but one wife: some individuals have two, and even three. The practice of several brothers living with one woman, so common among the Kandyans, they regard with disgust. The usages of the Veddahs do not permit a male to marry his mother or sister. No other degrees of consanguinity are forbidden. They are said to be jealous and very unkind husbands. When the males move to a distant part of the forest, in quest of prey, they are accompanied by their females. This labour they are obliged to undergo, even when the period of parturition is near. Should a woman be delivered of a child while on a hunting expedition, the infant is frequently exposed in the jungle, and becomes a prey to wild beasts. Infanticide is said to be not unfrequent among the settled inhabitants of the district of Bintenna, as well as among the wandering Veddahs. Should the Veddah determine not to expose his infant, it is rolled up in the smooth bark of a tree; and, after a few hours' rest, the woman rejoins her husband, when they proceed on their journey together.

The Veddahs associate very little with one another: the

head of each family considers himself independent, and responsible to no authority. It is said they have some idea of an appropriation of part of a district, and quarrels sometimes arise among them in consequence of the intrusion of the hunters of one forest into another.

The language of the Veddahs is a dialect of the Singhalese: it is harsh and unharmonious: the settled inhabitants find much difficulty in comprehending it. The Veddahs are ignorant of the use of letters, and they have no term in their language for a number above ten. It is asserted, however, that they occasionally carry on a correspondence with persons at a distance by means of cutting notches in a stick, and by tying certain knots upon a cord.

They have no knowledge of an all-powerful Supreme Being. Disease they believe to be always inflicted by evil spirits. When an individual of a family falls sick, the relations perform a number of ceremonies, with the view of averting the malign influence of the Yaku, the devil of the Veddahs. Dancing is a frequent means by which they endeavour to conciliate the favour of Yaku. The dancing ceremonies are generally conducted during night. They have no other musical instrument but tomtoms: these they make by stretching the skin of a guana over a portion of the rind of a gourd. As they believe that disease is invariably occasioned by the devil, no medicines are given to the sick. Indeed they are quite ignorant of the medical virtues of plants. To recover the sick, they trust entirely to the performance of ridiculous ceremonies and making oblations to Yaku. By mummery of this kind they expect to avert the consequences of his evil intentions.

The Veddahs are unacquainted with any substance of an intoxicating quality.

CHAPTER III.

Prevailing Diseases among the Inhabitants—Female Complaints—Notes respecting the Practice of Medicine among the Kandyans.

The diseases which predominate among the Kandyans derive their origin from the climate of the country: they have almost all an endemial source. Few of their complaints arise from the vitiated secretions of the living human body. Except the small-pox, they suffer little from the specific contagions. The diet of the Kandyans is extremely simple; they are, therefore, completely exempted from the complicated diseases that prevail in certain states of civilization; and which seem to be greatly occasioned by depraved habits of living.

Fevers of a remitting or intermitting type, and dysentery, are the prevailing complaints: these diseases are much more prevalent in the country below the hills than on the interior terrace. The months of June, July, and August, is in general the period of the year when the greatest sickness prevails. The inhabitants observe, that hot, dry, and parching weather frequently precedes and accompanies the prevalence of fever. Partial showers, succeeding a long period of dry weather, are supposed to aggravate the influence of the cause of fever.

During some seasons, fevers prevail to a much greater degree than in others. They sometimes become very prevalent in particular spots of the country, while the inhabitants of the adjoining districts are healthy. No satisfactory explanation can in general be given for either of these circumstances.

The provinces which lie to the eastward of the interior terrace are remarkable for insalubrity. This unhealthy tract

includes Nuwerakalawiya, Tamankada, Velasse, and Lower Ouwa. The late king of Kandy sometimes took advantage of the pestilential atmosphere of these districts, and transported thither the chiefs whom he considered disaffected to his interest. Some of his predecessors had adopted a similar plan to exterminate disloyal factions. Bintenna was commonly the spot to which they were deported.

Fever prevails greatly, during some seasons, in the above provinces. Few of the inhabitants, at these periods, escape its influence. The children are said to suffer in an extreme degree. Some of the children are attacked with severe fever, others droop and decline without much acute disease. The natural functions of the body become greatly impaired, the circulation is languid, and the processes of life are but feebly exerted. In many of these cases the countenance is bloated, the belly protuberant, and the inferior extremities anasarcous. An atrophy succeeds, and death supervenes, in a great proportion of the children who are thus affected.

Dysentery sometimes occurs among the Kandyans as a primary disease; more frequently it follows fever, and is accompanied by an anasarcous torpid state of the system.

The limits of the more insalubrious portion of the unhealthy districts are in some places very distinctly marked. Residents on the uplands and declivities of the hills avoid the low country; more especially during the dry monsoon: occasionally, however, they visit the flats during certain seasons of the year, where they cultivate a crop of corracan. As soon as the crop is ripe, they carry off the produce, and do not return to the unhealthy tracts until another season. Many of these migratory cultivators are attacked with fever during the temporary residence they make in the flats.

The fixed population of the flat districts, which lie eastward and northward from the inland terrace, is very limited, only 7.4 per square mile. One district, that of Tamankada, has no more than one inhabitant and two thirds in a space of equal extent. All the districts in this extensive flat are fre-

quently very unhealthy; and to the insalubrity of the climate we ought to ascribe the scantiness of their population.

But there are some reasons for supposing that these highly insalubrious flats were once populous, and extensively cultivated. In the level country, which extends from Trincomale and Batticaloa to the mountains of the interior, many magnificent remains of well-constructed tanks and religious edifices are found. The construction of these amazing works must have required the long-continued labour of a vast number of people, and argues a numerous former population. The neighbourhood of many of these ruins is now a desert and uninhabited by the human species, except during the occasional visits of the unsocial and migratory Veddah.

It is difficult to assign an adequate cause for the probable deterioration of the climate of these flats. The successive occurrence of a few unusually sickly seasons, or some devastating disease, such as small-pox, would occasion great depopulation, and a consequent waste state of the country, which may have had some influence in aggravating the causes of insalubrity.

I have seen a number of Kandyans suffering under a wide-spreading ulceration of the skin. In the Singhalese language this complaint is called *ara mauny wanny*. The disease occurs on all parts of the body, except perhaps the hairy scalp. The outer circle of the ulcerous surface extends, while not unfrequently the central area is healing. Occasionally, while some of the ulcers are healing, other parts of the skin become affected, and eventually ulcerate. Commonly the ulceration has a round shape, sometimes it is oval, occasionally it has no determined figure, and spreads over a large surface. The ulcers have never callous or elevated edges: in appearance they resemble phagedenic sores. The discharge from the ulcerated surface is generally a colourless glairy fluid; which, by drying, forms an elevated hard gray scab.

The cicatrices are generally well defined. Each cicatrix

is covered with a smooth shining cuticle. For the most part they are flat, but sometimes they are elevated and wrinkled, resembling the skin of a dried raisin.

This disease occasionally commits great ravages on the face. The forehead, cheeks, and lips are much liable to it. The nose and eyelids, however, suffer more from an extension of the ulceration than perhaps any other parts of the body. Sometimes the alæ of the nose become tubercular and ulcerated; more frequently they are destroyed by the progressive ulceration, which extends along the floor of the nostrils and destroys the velum pendulum palati. Superficially the ulceration creeps up to the lower eyelids, which are frequently destroyed, and occasionally the sight of the eye is lost. Sometimes the lower eyelids are everted from the cicatrization of the ulcerous surface on the cheeks. In one case, which came under my observation, the lips were so far united as hardly to admit the passage of a finger into the mouth.

Ara mauny wanny rarely affects the bones, except the thin bones of the nose; sometimes it extends over one or more joints, which become anchylosed, probably in a great degree from long want of motion.

The disease prevails more among the poorer classes than among the wealthy; the latter are not, however, entirely exempted from it. Many of the indigent become mendicants after they are attacked by the *ara mauny wanny*, and continue that profession for life. I have seen several cases of the disease among the Malays: they appear to be more liable to its influence than natives of the peninsula of India.

Apparently there is but little if any connexion between this ill-conditioned ulceration of the skin and a disordered state of the functions of the system.

The Kandyans seem to consider this complaint as nearly incurable. Under the use of simples, the ulcers occasionally heal up, often, however, for only a very short period: a permanent recovery appears to be hardly ever expected.

I have seen eight or ten cases treated with the blue pill, which was given so as slightly to affect the mouth. The symptoms were universally improved: indeed all those who took the medicine regularly recovered. How far the cures may be permanent I am as yet unable to say.

There is a complaint mentioned in the Kandyan medical works, called *parangy lede* (Parangy disease). Sometimes the disease is designated by the term *rata waha lede* (a foreign virulent disease). The *parangy* disease is divided into seven varieties, namely:

1. Aloo (ash) parangy.—An ash-coloured desquamating state of the cuticle.
2. Ody parangy.—Large ulcers covered with flattened crusts and scabs.
3. Cushta parangy.—Numerous ulcerated pimples on the skin.
4. Goney parangy.—An unequal, thickened state of the skin, resembling the skin of an elephant; or it is rough like a gunny bag, with ulcers on some parts of the body.
5. Dada parangy. Great itchiness of the skin, which, when scratched, breaks out in large ulcers, that are generally covered with a thick crust or scab.
6. Gette (or knotty) parangy.—Pains in the joints, followed by bumps or tumours, which afterwards burst, and form ulcers.
7. Ara mauny parangy.—Tubercular ulcerations on various parts of the body; sometimes several of the ulcerated tubercles unite, and form a large excrescence.

The above arrangement has the appearance of some discrimination: it is chiefly, however, in appearance. The Vederales (native doctors) often greatly confound the different varieties.

Parangy lede seems to have been originally intended to denominate a new disease; and from the similarity of the sound, and other collateral circumstances, it may perhaps be inferred that the term meant Portuguese disease. There is, however, no tradition among the Kandyans respecting the importation of a disease; and the priests assert, that *parangy*

lede is mentioned in the books which were written during the last incarnation of Buddhu. The assertions of the Kandyans in regard to the antiquity of their medical compositions do not merit our confidence.

Is it not likely that *parangy lede* was primarily intended to specify the venereal disease? This supposition is not unattended with difficulty. The books which treat of *parangy*, I am informed, do not ascribe the disease to impure contact. It is rarely, almost never, alluded to as a consequence of ulcers on the genitals. Some of the Vederales have an obscure notion that *parangy*, particularly that variety of the disease called "*ody parangy*," occasionally follows ulcers on the penis. None of them, however, profess to be able to distinguish the ulcer which is likely to be followed by a variety of *parangy* from that which is not succeeded by this disease. The Kandyan Vederales do not, in the early stage, exhibit mercury for the cure of ulcers on the genitals. Many of them assert, that they never knew ulcers in the throat or affections of the bones follow either running or ulcers on the penis. Some, however, state, that they have seen these symptoms succeed ulcers on the penis.

The colloquial communications of the Kandyan Vederales are very unsatisfactory relating to any point of their profession, but in none more than respecting *parangy lede.* They do not speak of it as a specific disease. It may be communicated, they say, by contact with the affected, particularly by using the same vessels, or walking with the same stick, as those who labour under the disease. This is the way in which they commonly account for the propagation of *parangy;* although they allow that it arises spontaneously. Children of all ages they say are affected by it.

Vederales of the highest reputation use the term *parangy* in a very general and undefined sense: except the *hori* (scabies), they seem to call every kind of cuticular eruption, *parangy.* Many of the cutaneous affections which they denominate *parangy*, are evidently herpetic, and cannot be refer-

red to a syphilitic origin. Cases of *parangy* have been pointed out to me of twenty years standing. This is very different from the progressive disposition ascribed to the venereal disease. I can form no satisfactory conclusion respecting the origin and primary import of the term *parangy lede*. More inquiry is necessary before we are warranted in determining any thing on the subject.

In regard to the treatment of parangy the Vederales are nearly unanimous. They all recommend the use of mercury, should other means fail in producing a cure. They generally, however, give their simple remedies a trial of two or three months before the administration of mercury is commenced.

Female Complaints.

It is very difficult to acquire a satisfactory degree of information regarding the complaints peculiar to females in the Kandyan country.

The menses *(kili)* sometimes appear in Ceylon as early as the termination of the eleventh year; for the most part, however, this sign of puberty does not appear before the twelfth or thirteenth year. In some instances, I am informed, the appearance of the menses is protracted to the nineteenth or twentieth year. In the Kandyan country females are, during their monthly infirmity, considered unclean, and separate themselves from the rest of the family. At some of the great festivals females in that state were exiled from the town of Kandy *.

I have not learned that *mayha* or *premayha* (fluor albus) is a frequent disease among Kandyan females. The half-cast race on the coast of the island, are said to be very generally afflicted with it. According to the Vederales, there are twenty species of this complaint, ten of which originate from phlegm, six from bile, and four from wind. They make, however, little or no distinction in the mode of treatment, which chiefly consists of purgatives, generally of the powder of the root of

* Leviticus, xv. 24; Ezekiel, xviii. 6.

tristawalla (convolvulus turpethum), and of the decoctions of astringent barks and leaves.

The Kandyan Vederales make frequent inquiries respecting the means of preventing sterility in females. I have not, however, learned that barrenness is frequent among married females; but it is extremely difficult to obtain satisfactory information on this subject. It is likewise very difficult to procure correct statements of the number of children produced by one marriage, I should, perhaps, rather say, born by one woman; for females are not, in general, supposed to confine themselves to the embraces of a single male.

In the Kandyan medical books, some instructions are given relating to the science of midwifery; and the Vederales profess to exhibit medicines to promote child-birth. Women in labour are deemed unclean: they are, therefore, not visited by the Vederale, who would consider himself polluted, if he even by accident entered a house wherein a woman was in child-birth. During labour they are attended by one of their own sex.

The following information regarding this subject I collected from several females who have been long in the habit of assisting women in labour.

Parturition does not appear to be in any remarkable degree shorter in this country than in high latitudes. It seems, however, to be attended with much less danger. Two or three midwives have each of them assured me, that although they had assisted at nearly one thousand labours, not one case had died during delivery. Flooding to a dangerous extent they had never seen.

In presentations of the head the midwives attempt to facilitate delivery by pressing it into an oval shape. When a superior extremity protrudes, they endeavour to return it. One woman informed me, that in two instances, after having failed in returning the arm, she introduced her hand into the womb, grasped the child by the feet, and in this manner delivered her patient. They tie the umbilical cord with one li-

gature, and divide it with a knife about three inches from the belly of the infant.

The midwives ascribe very bad consequences to a retention of the placenta. They say, that the woman will be suffocated should it not be speedily extracted. As soon, therefore, as the child is born, the woman is directed to inhale the air, so as to distend the thorax, and by that means assist in expelling the placenta. For the same purpose they sometimes desire the patient to blow with force into an empty bottle. Should these means fail, the placenta is extracted by introducing the hand along the cord, and bringing it away. Some midwives are more precipitate in rendering manual assistance than others. One stated that she never permitted the placenta to remain for above four or five minutes. Another said she did not give manual aid until such a period had elapsed as would afford her time to chew a mouthful of betle. This period may be estimated at from ten to fifteen minutes. The Singhalese measure time by the space that elapses during which a person can chew a quantity of betle.

A band of cloth is then put round the belly of the woman, which is retained for about fourteen or fifteen days. She is, at the same time, directed to swallow a draught composed of arrack, mixed with powdered ginger and black pepper. This mixture is called *kare miris*.

Bolusses of powdered ginger and pepper are sometimes given for two or three days after delivery: should the woman recover gradually, a collection of the leaves of from five to nine different kinds of trees, is made about three or four days after delivery. The leaves are tied up in bundles, and a decoction is made of them: to this decoction, including the leaves, an adequate quantity of warm water is added: this forms a bath for the woman. She is to use this bath three or four times in the course of about fifteen days after delivery: at the end of this period the cold bath is directed to be used.

Twins are rare in this country. None of the midwives with whom I have conversed, ever heard of triplets. De-

formed infants are very uncommon. The midwives mention having seen only hare lip and distorted feet.

Infants are liable to a disease which is called *baly kiri dose* or *baly greha* (young milk disease). This complaint supervenes during the period which precedes the tenth day after the birth of the child: subsequently to the tenth day it seldom or never occurs. The chief symptoms of the *baly kiri dose* are frequent crying, a blue circle round the mouth, general convulsions, and stiffness of the muscles which move the lower jaw. Charms are much practised to cure this disease, together with offerings to the gods, particularly offerings of odoriferous flowers.

Notes respecting the Practice of Medicine among the Kandyans.

The Singhalese in general attribute the invention of medicine to Buddhu, who instructed a priest in the knowledge of the virtues of medicinal substances, and the mode of compounding them for the cure of diseases. This priest, who is said to have been the son of a king, composed many books relating to the healing art. From his works, and the extracts which have been made from them, the Vederales profess to derive all their knowledge in the science of medicine.

Medicine is not followed exclusively by particular individuals as a profession. The priests being better acquainted with the manuscripts of the ancients, than the other classes, have the character of being superiorly skilled in the science of healing. A knowledge of medicine is sometimes claimed by the successive generations of a particular family.

The Kandyans know nothing of the animal economy, or the theory of diseases. Their practice is a compound of charms and incantations, with the exhibition of a few medicinal substances, chiefly vegetable simples. The Vederales profess to be entirely guided by the writings of their ancients. A knowledge of the information contained in the books of medicine, is all they assume. They disclaim acquiring inform-

ation by observation and experience. Almost every individual, therefore, who can read, pretends to a knowledge of the virtues of simples, and an acquaintance with the treatment of sick.

The dissection of the human body has never been practised by the Kandyans. The Vederales have, however, names for some of the viscera of the thorax and abdomen, which implies some acquaintance with the different parts of the body. It is not pretended that this knowledge was acquired by dissection: they say, the authors who mention the different viscera, obtained a conception of them through the influence of a "divine eye."

From the predominance, deficiency, vitiation, or disproportion of *pit* (bile), *wate* (wind), and *sem* (phlegm), the varieties of the different diseases incident to the human body are occasioned. The chief seat of bile is about the scrobiculus cordis; that of wind, about the umbilicus; phlegm, between the shoulders.

Evil spirits are accused of being great inflictors of sickness; and to avert their malign influence, the Kandyans in general practise divination, carry charms about their bodies, and make propitiatory offerings to these imaginary beings. Disease is likewise ascribed to the anger of the gods. Eclipses and other celestial phenomena are sometimes assigned as causes of sickness.

One of the Kandyan medical books commences with the following passage, which may be considered as a fair summary of their opinions regarding the origin of disease: "Unwhole-
"some food; improper mixtures; putrid meat; dry and de-
"cayed vegetable food; vegetable poisons; intoxicating li-
"quors; bites of venomous creatures; indigestion; planetary
"influence; improper medicines; the anger of the gods; a
"superfluity of wind in wet and stormy weather; contusions;
"incised wounds; fatigue and exhaustion from hard labour;
"give rise to various diseases."

The opinions of the Vederales in regard to the existence

of bile, wind, and phlegm, resemble those of the ancients respecting the four distinct humours which were supposed to originate the different temperaments of the animal frame. The Vederales say, a person in whose constitution bile predominates, is apt to be attacked with violent fever, if he resides for a short time in a hot climate, such as the sultry flats of the Wanny, or Velasse districts. Under similar circumstances, constitutions where wind or phlegm predominates are much less liable to severe fever. The Vederales assume great skill in the prognosis of diseases. Some of them pretend to learn the state of the sick person by the quality, movements, &c. of the messenger who comes to solicit their attendance upon a patient. They pay much attention to the general appearance and motions of the sick, and prognosticate unfavourably, in proportion as the countenance differs from that of health. Moving the hands towards the face, and frequent muttering, are deemed fatal symptoms. The evacuations by stool are not examined by the Vederales, but they question the attendants upon the sick respecting them. Liquid blackish stools are deemed unfavourable, as also those mixed with blood.

The Vederales affect to be particular in ascertaining the state of the pulse of their patients. When a Vederale feels the pulse, he commences the operation by seizing the four fingers of the right hand of the patient with his right hand, and pulls them a little: sometimes each finger is pulled separately. With the four fingers in the right hand of the Vederale, three fingers of the left hand are applied to the usual place of feeling the pulse. The pulsation felt by the index finger, is called *sem nadi* (the phlegm pulse); that by the middle finger, *pit nadi* (bile pulse); by the ring finger, *wate nadi* (wind pulse). The disease is said to originate from a combination, redundancy, or disproportion of wind and phlegm when the pulse is felt beating strongly by the ring and middle finger. Should the pulse be felt full by all the three fingers, then the disease arises from a combination of phlegm, bile, and wind, and is called *sanipate* (a fatal disease). In cases of

sudden sickness, where the wind pulse was originally full and the bile pulse small, recovery is indicated by the rising of the bile pulse, while the wind pulse becomes less strong. A falling of the bile pulse, and a rising of the wind pulse, indicate a fatal termination of the disease.

The pulse of both arms is always felt, and with an equal degree of attention to the requisite forms. In males the pulse of the right arm is first felt, that of the left in females.

The Vederales compare the wind pulse to the motion of an ant, slow and rather small. The phlegm pulse is compared to the motion of a caterpillar. The bile pulse, they say, is full, hard, and quick: it is compared to the galloping of a horse. An intermitting pulse is compared to the jumping motion of frogs. Death is indicated by a pulse which they compare to the motion of wind, and by the involuntary motions of the muscles of the extremities, which are supposed to resemble the dancing gait of the peacock.

Should the pulse resemble the gait of an elephant, firm and slow, a recovery may be expected. The patient is in much danger when the pulse resembles the motion of a snake following a frog, undulating and quick. Death is said to be near at hand when the pulse resembles the jumping motion of a flea.

The ordinary diet of the Kandyans being, in general, very simple, the necessity for much restriction in this respect, during disease, is not great. The Vederales recommend, however, a very low diet. For nourishment the patient drinks rice-water; and as a beverage, hot water is chiefly used.

Yams, sweet potatoes, jaggery, and honey, when eaten towards evening, are supposed to be difficult of digestion, and to occasion disease by disturbing the phlegm. Flesh meat, such as pork, buffalo beef, game of all kinds, if eaten at night, is said not to be easily digested. Animal food is supposed to disarrange the wind and bile: to remedy the indigestion which succeeds the eating of animal food at night, aromatics, vinegar, and arrack, are recommended.

Medicines are generally exhibited in the form of decoction *(kassaye);* of powder *(choorna);* or in that of pills *(goolie.)*

Fresh wounds are commonly stuffed with a powder chiefly composed of pulverized dammer, a species of resin. Sores are frequently covered with chopped leaves and bark of trees: sometimes they are dressed simply with leaves, which are prepared for application by being boiled in rice-water. As a poultice they use *wal-loonoo* * (wild onions) and the chopped leaves of the datura stramonium. Honey mixed with lime is a common application to boils *(gadoo.)*

The Vederales attribute the remote cause of fever to drinking impure water, particularly if buffoloes or elephants have been washing in the tank from whence it was taken. They likewise ascribe a powerful influence to the odour of the flower of the *macola gaha* in producing fever. This tree is said to abound in the flats immediately below the hills, and grows near to the oozy banks of large rivers. Its period of efflorescence is during the months of June, July, and August; but the agency of devils is, according to the Kandyans, the most fertile source of fever. To avert their malign influence in this respect, all ranks of the Kandyans practise the mummery of necromancy, and make propitiatory offerings to the devils. They profess to have great confidence in these means of preventing, as well as in curing, disease.

In the Singhalese language, fever is denominated *una* (heat); this affection of the system they divide into a great number of species or varieties. The combinations of the consequences of disordered phlegm, bile, and wind, are assigned as the origin of the manifold species of fever.

The milder kind of fever is called *jwara una,* or *mara una:* the more malignant class is called *sānypate una,* sometimes *vissamet jwara.* Fevers of this kind are sometimes fatal in four or five days. The cachectic anasarcous state of

* I am sorry I have not been able to obtain the scientific name of wal-loonoo, and a number of other plants mentioned in this work as used by the Kandyans in medicine.

the system, which often accompanies long-protracted fever, is denominated *pāndoo idoomun*.

In the treatment of fever, and I believe in almost all diseases, charms are greatly resorted to: along with much foolery of this kind, a purgative is exhibited to the patient: the purgative generally consists of the fruit of the *jayapala* (croton tiglium *). Decoctions of leaves and roots, together with a variety of aromatic seeds, then follow. Under fever the diet chiefly consists of rice-gruel, and rice without salt or any other condiment.

Delirium, and other morbid mental affections, are deemed proofs that the patient is possessed by a devil. Many forms of adjuration are practised to exorcise the evil spirit.

Dysentery, *le sidan attisare* (frequent dejections of bloody mucus), is ascribed to causes similar to those which are supposed to occasion fever: for the cure of this disease, the Vederales give the juice of astringent vegetables made up in the form of pills. They likewise mix astringents along with the rice-gruel which is prepared for the sick. Opium in small quantities is occasionally exhibited in dysentery: they also give powdered aroloo, a species of myrobalans, mixed with sugar, or cocoa-nut water.

More confidence seems, however, to be placed in the influence of charms, &c. for the recovery of the sick, than in the use of medicine of any kind. In this opinion the Vederales, partly from ignorance, and, perhaps, in part from policy, appear to join. They all pretend to be exorcists as well as doctors; and except the Vederales among the priests, they assist at the ceremonies of adjuration. The following is one of the least operose of their feats of enchantment. A small ornamented square bower of plantain-trees is constructed near to the house of the person who is sick: towards evening the exorcisms in

* The Vederales generally prepare the seeds of the croton by roasting them in cow-dung. They are exhibited to the patient, mixed with the pulp of some fruit, such as plantain. One seed is considered a full dose.

general commence. The patient being brought out of his house, he is seated upon an inverted wooden mortar in the bower with his face towards the south. Close to his feet are placed offerings to the devils, which commonly consist of a chicken, cocoa-nuts, a quantity of rice, some roasted paddy, and a branch of a lime-tree bearing seven limes. During this ceremony the Vederale is assisted by a number of petty conjurors. Each of them is furnished with a small drum, which they beat in a most discordant manner. This instrumental noise is accompanied by much vocal clamour. The ceremonies consist chiefly of loud incantations, leaping, dancing, and performing wild fantastic gestures. In this manner they pass the whole night.

Internal diseases they frequently treat with external applications. For pleurisy, *wate œwililla*, they use hot fomentations. This application is prepared by inclosing a number of roots and leaves in a cotton cloth. The parcel is then suspended in the steam of boiling water, and kept in this situation for a considerable time. It is then applied very hot to the seat of the pain. Vesication is occasionally thus produced.

Having obtained a medical work in the Singhalese language, of some repute, the Rev. Mr. Lambrick did me the favour to translate a portion of it, which I subjoin as a specimen of the medical literature of the Kandyans. Unfortunately neither the author nor the period when the *Veda Potta* (Book of Medicine) was composed is known. These important omissions are general in the works of the Singhalese. The following specimen of Kandyan medical learning comprehends the contents of the work in question, together with the substance of the first, fourth, twenty-third, and twenty-eighth sections.

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23. ——————————— Diseases of the Skin.
24. Upon Medicines proper for the Belly-ache, arising from Worms and other Causes.
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31. Upon the Medicines proper for Swelling with Pain of the Joints of the Extremities, Loss of Power, with a Sense of Numbness of the Hands.
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Section I.—*Upon the Symptoms of Diseases.*

Symptoms connected with the messenger who requests the attendance of a Vederale upon a patient.

If the messenger be a low cast man; if he be lame or maimed; if he has lost his nose by disease; if he has a turban on his head; if he has a stick or a weapon in his hand; if he has red, black, or ragged clothing, or only a single cloth

round his loins; if he speak ominous words, unfavourable to the state of the patient; if he rub his hands, or put them on his belly; if tears fall from his eyes; if his body has been rubbed with oil; if the messenger be a woman, or a hermaphrodite; if he be a stammerer, or deaf:—these are all sinister omens; and should the messenger have nothing good in his hands, they betoken a fatal termination to the disease.

When the Vederale proceeds to visit a patient, it is auspicious for him to meet on the road a virgin, a cow, a conch-shell, a drum, curds, sweet-tasted fruit, a golden-coloured flower, a lighted bonfire, a river, a flag, or a red cloth; it is likewise favourable for him to be in good spirits, and for the sky to be cloudy, to see white rice (boiled), to meet a man of learning, or a meretricious woman, or fresh flesh-meat—to receive gratulatory words from those whom he meets:—these are all encouraging circumstances, and are propitious both to the patient and the Vederale.

On reaching the patient, the Vederale is to take some water in a leaf; and, after repeating a charm, he is to sprinkle the sick person with it: if, after being thus sprinkled, the patient touches his own foot, he has one year to live—his ankle, he has six months to live—his cheek, three months—his forehead, six weeks—eyebrows, nine months—throat, seven weeks—eyes, five days—nose, three days—tongue, one day.

A sick person, his friend, or the Vederale, having offered flowers and incense to the gods at the *dewale**, is permitted to pray that he may be informed in a dream as to the event of the present sickness.

To dream of having eaten honey or tippely oil—to dream of seeing a man dancing covered with mud, or plunging in mud—to dream of riding to the south on a hog, or a buffalo, or a camel—to dream of wearing red or black clothes, and leading a woman by the hand proceeding southward—to dream that he sees a stone, or a tree, or the sun, or the moon, fall—

* *Dewale* literally means House of God. The Brahminical deities are worshipped at the dewales.

to dream of having been bound and led—to dream of walking over a white ant's nest or a prickly tree, or of receiving black clothes or cotton-tree ashes, or rice (dressed), or butter-milk;—is very inauspicious: if a person in health so dream, he will fall sick; but if a person under disease dreams in this manner, he will not recover.

To dream of seeing the sun or the moon, of mounting an ox or an elephant or a horse—to dream of ascending to the upper part of a house, of climbing a fruit-tree, or a lofty rock —to dream of seeing a god, or a bramin, a king, or flags, or white cloth, or clear water, friends, relations, jewels, or that he swims in the sea;—these are favourable omens: whosoever dreams after this manner while sick, will recover; and if in health, he will be fortunate.

The following are unfavourable symptoms in a patient: dimness of sight, deafness, loss of the senses of smelling and tasting, dislike to friends (such as the Vederale, his teacher, or his wife), refusing medicines or abusing those who bring them, phantasms of the imagination, inability to see his own face in a mirror, stripping himself quite naked, perpetual drowsiness or great want of sleep, eating much without any evacuation, or eating little with frequent dejections, cadaverous smell, blue flies lighting upon the body.

The patient being glad to see his Vederale (as glad, indeed, as if he were to see his teacher, or even a god), and for him to follow devotedly and with cheerfulness the directions of the Vederale regarding diet, medicines, &c.—are favourable prognostics of recovery.

There are four circumstances which are very favourable to a person under sickness: 1. To be attended by a skilful Vederale; 2. To have a careful person to collect the simples prescribed by him; 3. A cheerful acquiescence on the part of the sick to the directions of the Vederale; and, 4. A vigilant nurse.

Four important qualities of a good Vederale.

1. He should be a man of long experience.
2. He should not be too anxious for a great reward.

3. He should be prompt in deciding upon the means of cure.
4. He should be a kind-hearted man.

A country abounding with rocks and running streams is not productive of diseases arising from a superfluity of wind or phlegm.

A jungly country that has but few running streams is not productive of disorders arising from a redundancy or vitiation of blood or bile.

A country that is moderately supplied with large trees and running streams is not unfavourable to the production of any disease.

According to the science of medicine, the year is divided into six equal portions (the first commences about the middle of April):

The first division is, ... a cold season.
The second is, ... the hot season.
The third is, ... the rainy season.
The fourth is, ... the clear weather season.
The fifth is, ... the foggy season.
The sixth is, ... a cold season.

The first two divisions are favourable to disorders arising from wind; the third and fourth, to disorders arising from bile; the fifth and sixth, to diseases arising from phlegm.

The duration of human life is divided into three periods. The first extends from birth till ten years of age; this is the period of childhood: the second extends from ten to seventy years of age, and is called the period of middle age; the third extends from seventy upwards, and is called the period of old age.

During the period of childhood phlegm prevails; in middle age, bile; in old age, wind.

Persons under sickness are divided into three classes, according to their bulk; namely, the lean, the middling, and the corpulent. Some medicines cause corpulency, and others occasion emaciation; the former may be given to emaciated patients, the latter to those of a corpulent habit; both extremes

are to be avoided when treating a man belonging to the middle class.

The following decoction is recommended for reducing the corpulent:

Take of *Tippal* *,
Moraghas (the heart of the tree),
Ratnethul (the root), Plumbago rosea,
Kaha (the root), Curcuma longa:
Two calandas † of each; then add water sufficient to cover the articles: boil for some time. This decoction is to be divided into four portions; one portion is to be drunk in the morning, and another in the evening.

The following means are recommended to make lean persons fat:

Good living (namely, juicy animal food, rice which has been raised upon high grounds) and a sedentary life.

Section IV.—*Upon the Medicines proper for pregnant Women.*

Any woman being married and not having children, but desiring to have them, let her use the following medicines in the manner prescribed.

Take of the tender buds of the *nuga-ghas* (ficus Benghalensis), the milky juice of the *wara* shrub (asclepias gigantea), grind them together between two stones, and strain the expressed juice through cloth. Four drops of this juice are to be snuffed up the nose on the day that she returns to

* *Tippal* is a powder composed of the fruit of three different kinds of myrobalans.

† The lowest weight used by Kandyan Vederales is denominated *madata*, the seed of a tree called *madati*. The Singhalese of the maritime districts call this weight manjadi.

The *madata* weight is equal to four grains.

12 *madata* are equal to one pagoda.

20 *madata* are equal to one *chalangy* or *calanda*.

44 *madata* are equal to one Surat rupee.

the house after her purification: if passed through the right nostril, she will give birth to a boy; if through the left, to a girl.

To facilitate labour, the lower belly is to be anointed with an embrocation made of the roots of the white-flowering *ellawora*, and the root of the *kūnu karanda*, ground with water. The roots should be pulled, ground, and applied in perfect silence; hence the application is rendered very effectual. In difficult parturition, take a portion of a human skull, reduce it into an impalpable powder, then mix the powder with human milk: with this mixture embrocate the soles of the feet. This application must be removed immediately after the birth of the child, as it may do much harm if allowed to remain.

Should an arm or a leg or the breech present, the infant being dead, and all other means of delivery having failed, it is to be cut in pieces and delivered.

Section XXIII.—*Diseases of the Skin.*

Men who live in a constant state of sin, who defraud the gods, or bramins, or anchorites, or women, or animals, or oxen; men who separate friends; will be afflicted with disordered bile, phlegm, and wind, occasioning virulent cutaneous diseases.

In cutaneous diseases, the skin becomes rough and painful; the hair of the body at the same time standing upright. The skin being scratched in consequence of itchiness, a fluid will exude, and the sweat will become profuse, attended with lassitude. These are the chief symptoms in cutaneous diseases.

This class of diseases is divided into eighteen species, namely:

1. *Udumbera.*—The skin having the colour of the ripe fruit of the *diwool or dimbool* (acacia Arabica).
2. *Sawitra.*—The skin having the colour of a white conch-shell.
3. *Kake.*—Skin covered with pimples, like the seeds of the plant olinde (abrus precatorius, Lin.).

4. *Charmake.*—The skin being rough, like that of an elephant.
5. *Punda-rike.*—An eruption of pimples, resembling the bud of the red lotus.
6. *Irshia juhay.*—Skin rough, like a stag's tongue.
7. *Satārūyā.*—Numerous ulcers over the body.
8. *Eke sanyataya*, or *sangigna.*—A general affection of the skin of the whole body.
9. *Charma jaly.*—Hands chopped, exuding a burning ichor: a whitish swelling of the palms.
10. *Wipata kay.*—The same symptoms on the soles of the feet.

These ten species are very difficult of cure.

11. *Kapalaya.*—Skin black and desquamating.
12. *Stoolia racksia.*—An enlargement of the joints of the body, with pimples upon the protuberant spots.
13. *Kiddi-baya.*—Indurated tubercles of the skin of the limbs.
14. *Dad draya.*—Skin furfuraceous, resembling the scales of a fish.
15. *Sid daya.*—Circular spots upon the skin, of a light yellow colour: skin smooth and soft.
16. *Pamāya.*—A confluent eruption of reddish pimples.
17. *Wiwatche kaya.*—Reddish pimples, exuding a serous fluid.
18. *Racksia.*—A burning eruption on the limbs and trunk.

These eight species are easily cured.

Among the different kinds of *cushta lede* (a term synonymous with cutaneous disease) must be reckoned the *hori* (scabies), which is a disease of the skin. *Cushta* diseases that arise from disordered wind, are attended with a roughness of the skin and much pain; the natural colour remaining, or else a slight redness. Those that originate from bile are attended by a burning sensation, the skin becoming red and covered with ill-conditioned sores, which discharge profusely. When cushta diseases arise from phlegm, the skin is white, smooth,

and heavy, the body being at the same time increased in bulk. *Cushta* diseases which originate from the combined effects of disordered wind, bile, and phlegm, have all the above-enumerated symptoms, and are therefore very difficult of cure. *(The eighteen species of diseases of the skin are divided into seventy-two varieties. The difference of the varieties is supposed to arise from wind, phlegm, bile, and a fanciful combination of them.)*

There are seven textures of the body, each of which may become the seat of disease; namely, the surface of the body, the blood, the flesh, the bones, the fat, the marrow, and the less solid part of the marrow. These textures being affected protract disease.

When the skin becomes discoloured and rough, these are symptoms of the *twack gatta cushta*, or an affection of the texture of the skin. Profuse sweating indicates an affection of the blood. Pimples on the hands and feet show that the flesh is affected. The cushta diseases which originate from a disordered condition of the other four textures being incurable, they are therefore passed over.

The diseases that arise from an affection of the skin are to be cured by unguents; from an affection of the blood, by the abstraction of blood; and from an affection of the flesh, by purgatives, the cure being promoted by the exhibition of medicines in a fluid form, or in that of an electuary.

All cushta diseases which originate from a disorder of the blood are accompanied by a disarrangement of the wind, phlegm, and bile: hence, if the patient be of a strong constitution, blood is to be abstracted; but if he be of a weak habit, the withdrawing of blood will be prejudicial. On that account recourse must be had to purgatives and emetics.

(In the Veda Potta here follows an account of the means of cure directed to be used in the first six species of cushta diseases, but which I have omitted, as being without interest.)

Parangy lede is a variety of the seventh species, namely,

satārūya. I have subjoined all that is given in the Veda Potta regarding this disease.

For the *parangy* disease take the expressed juice of *cossambo* leaves (melia sempervirens), and boil it in congee. This is to be drunk by the person affected, and a cure will be obtained.

Take the juice of the pods of *mangal caranda*, and drink it for several successive mornings. This will cure *parangy* swellings.

Provide part of the bark of an old *moranga-tree* (hyperanthera moringa), then take a pumkin and cut a section from one end of it; scoop out a portion of the pulp, and put the bark in its place; then cover the bark with the section of pumkin which was cut off; let it stand for a night: next morning squeeze the moranga bark and pulp of the pumkin together, and press the juice through a cloth: to the strained juice add some lime-juice, then bruise the pumkin, as also a single fruit of the *brinjal:* after mixing them with the expressed juice, boil the whole to the consistence of honey. Let this be eaten in the morning, and it will remove the pains of *parangy lede.*

Take of the root of *wara* (asclepias gigantea);
Hingal (shadilingum) (cinnabar);
Sadika (nutmegs), three *chalangys*, or *calandas*, of each;
Navacharum (muriate of ammonia), 5 madatas;
Vulley-pashanum (white oxide of arsenic), half a calanda.

Grind the above articles between two stones; then divide the whole into eight equal portions, and wrap each portion in a piece of cloth. With one of these portions the person affected is to be fumigated twice a-day for four days: the fifth day he is to take no medicine; on the sixth he is to bathe.

By this means the swellings and the dried ulcers of *parangy lede* will be cured.

Expose three calandas of plumbago to a red heat in an

earthen vessel; then introduce into the pipkin one calanda of *rasadia* (mercury): having withdrawn the fire and the mixture become in part cool, stir it with a piece of rolled cloth, and it will assume the form of ashes. Let this preparation be put aside.

Take of the roots of *rat nethul* (plumbago rosea),
——— the roots of *pilla* (toranthus),
——— the bark of *kapitya* (croton lacciferum),
——— the dried bark of *hiembila* (tamarindus Indicus),
——— the bark of *naghas* (mesua ferrea); three calandas of each; grind these articles separately:
Take of *gandaga* (sulphur),
——— *herial* (yellow sulphuret of arsenic); of each seven madates.

Grind the sulphur and the arsenic along with the above five powders. The preparation of *rasadia* and plumbago is then to be added, and all ground together. To the general powder add the juice of *erabadoo* leaves, and form a mass of the whole. Then take a piece of cloth and moisten it with the milky juice of *wara* (asclepias gigantea). Divide the mass into fourteen portions, and wrap each portion in a piece of the cloth prepared as above directed. Make charcoal of the tamarind-tree, ignite it, and put one of the parcels upon the fire, taking care to inhale the fumes which arise from it.

When other modes of using mercury have failed, this plan will cure the *parangy* disease.

Section XXVIII. *Of the Treatment necessary for Ulcers of the Penis.*

There are five constitutional causes of ulcers of the penis; namely,

1. A redundancy or vitiation of wind.
2. ——————————— of bile.
3. ——————————— of phlegm.

4. A redundancy or vitiation of blood.

5. An irregular combination of wind, phlegm, and bile.

Three local causes are likewise assigned; namely,

1. Scratching.

2. Cohabitation with women.

3. Sexual contact with women, they having ulcers.

When any of these causes occasion a tumour, or ulcer, upon the middle of the penis, the disease is then called *upa dansa*. When, being excoriated, the tumour becomes black and painful, the disorder arises from wind: when the tumour is accompanied by a burning sensation and a red colour, the disease originates from bile. When the ulcer discharges freely and extends much, the disease arises from phlegm. When the tumour, or abscess, is dark-coloured and discharges only a reddish fluid, having minute papulæ upon the skin, and continues to enlarge, with great heat, then the disease arises from blood. The aggregation of all these symptoms, when it occurs, is occasioned by an irregular or undue combination of wind, bile, and phlegm.

When worms form in the ulcer, the penis mortifies and sloughs off. Before mortification takes place, the part is to be anointed with medicinal oils and blood drawn from the parts adjoining to the ulcer, for which purpose leeches are very good. These means failing, then amputate the penis above the ulcer, and apply the proper remedies.—*(In the Veda Potta, here follows an account of the medicines recommended for the cure of ulcers of the penis, when the complaint arises from the uncombined agency of wind, bile, phlegm, or blood, which I have omitted, as being very uninteresting.)*

The following medicines are suitable for the disease, from whatever cause it may arise.

Take of the bark and leaves of the following trees:

Ambo—Mangifera.

Domba—Calophyllum inophyllum.

Cossambu—Melia sempervirens.

Debera.

Of these articles make a decoction, with which the ulcers are to be washed.

For another lotion, take the following articles, and make a decoction of them.

Arooloo—Terminalia chebula.
Booloo— ———— bellerica.
Nelli— ———— emblica.

Take the bark of the following trees:

Essetu.
Boghas—Ficus religiosa.
Pulila.
Nughaghas—Ficus Bengalensis.
Dimbool—Acacia Arabica.

Equal parts; grind them well between two stones, then take twelve calandas of the powder, to which add water, about an English pint, tippely oil, four ounces; boil until great part of the water be evaporated, then separate the oil, which is to be applied to the affected parts.

The following is the substance of the information which I have been able to acquire respecting the practice of the Kandyan Vederales for the cure of gonorrhœa, ulcers on the parts of generation, and the constitutional consequences which sometimes follow these affections.

The Vederales state that there are two kinds of gonorrhœa. One kind they denominate *agny praima* (fire love), the other *oosna praima* (heat love): the former they consider a simple mucous discharge, arising from debility; the latter they ascribe to impure sexual contact. Every discharge from the urethra, which is attended with a painful heat of urine, obtains the name of *oosna praima.*

For the cure of both kinds of running the Vederales recommend the use of vegetable decoctions, copious draughts of milk become a little acid, and cocoa-nut water. Purga-

tives are sometimes exhibited, chiefly of the *jayapala* (croton tiglium).

Ulcers which appear on the penis after sexual contact, are called *mool* (root), and *wana* (sores); *mool wana* is therefore synonymous with the term primary ulcers. Some ulcers heal easily, and are considered simple; others are obstinate, and resist the curative influence of common remedies. The latter kind are supposed to have a peculiar quality.

The ulcers are for the most part dressed with the juice of astringent plants. The juice of the plantain-tree is considered a good application. They are likewise often covered with a compound oil or unguent, chiefly composed of oil extracted from the seeds of the *talā* (sesamum orientale). To prepare this compound oil, a number of aromatic seeds are bruised between two stones. This powder is put into an earthen pipkin, along with the expressed juice of the leaves of several plants; the tala oil is then added, and the whole boiled for a considerable period: sometimes a small quantity of *palmanikum* (sulphate of copper) is added, and at other times, *sahindu lanu* (muriate of ammonia) *. The decoction having been continued a sufficient length of time, the oil or unguent thus formed is carefully separated from the grosser parts. After applying the oil to the sores, they are covered with the leaves of trees, boiled in rice-water.

Buboes are dressed with a variety of substances, such as the juice of succulent plants, to which rice-meal is added, and sometimes honey. This forms a paste or cataplasm, which is considered a good discutient. They are likewise occasionally covered with a cataplasm composed of the fresh roots of ginger, bruised, the roots of the moranga-tree, with the roots of some other trees, and cow's urine. When buboes open, the ulcers are treated in the same manner as ulcers on the penis.

Should these, or similar applications, not cure the ulcers and buboes in three or four months, the Vederales then re-

* See Appendix, No. I.

commend that mercury should be exhibited. This medicine is not in general given to such a degree as to occasion salivation. Only one of the Vederales, with whom I conversed on the subject, seems to think that it is sometimes necessary to produce ptyalism.

Constitutional symptoms are, by some Vederales, said occasionally to follow ulcers on the penis. The secondary affections mentioned, are papular scabby eruptions on the skin, copper-coloured spots and blotches, ulcers in the throat, painful tumours on the shin-bones, and an enlargement of some of the joints. These symptoms receive the inexplicit denomination of *parangy lede:* the primary ulcers do not obtain this appellation.

The Vederales state likewise, that eruptions and blotches appear on the skins of children and adults, who have not had primary ulcers, exactly similar to the eruptions and blotches which sometimes follow ulcers on the genitals. They do not pretend to be able to assign a specific difference between them, and no distinction is made in the plan of cure.

In regard to tumours on the bones and swellings of joints, the most learned of the Vederales which I have seen, says that he considers these as aggravated symptoms of the equivocal disease called *parangy lede;* and as the symptoms which obtain this appellation occur without primary sores, he therefore believes that nodes and enlarged joints appear unconnected with sores on the penis, occasioned by sexual contact.

The Vederales commence the treatment of eruptions and blotches with vegetable decoctions. They likewise sometimes use topical applications, in which *palmanikum* (sulphate of copper), and *rasadia* (mercury), are the active ingredients. Should the cuticular eruption not disappear under the use of these medicines, before three or four months have elapsed, then mercury is recommended to be exhibited internally.

These eruptions are said frequently to disappear under the exhibition of vegetable decoctions, and sometimes without medicine of any kind.

One of the Vederales says, he thinks mercury is generally necessary where the bones are affected: the others are not decided on this point. When mercury is not exhibited under this form of the disease, it is said that the symptoms are protracted to a very long period. I have not, however, learned the ultimate event.

The Vederales seem to consider the ulcers which follow promiscuous sexual intercourse as generally admitting of a natural cure. They appear, however, to regard them as different from ulcers on other parts of the body. The exhibition of mercury is not deemed essential for the cure of either primary or secondary symptoms: they seem to have recourse to it in cases only which long resist the use of other remedies. One of the Vederales entertains a notion, that the exhibition of mercury for primary symptoms will prevent a constitutional affection: the others appear to have no such opinion, and use this mineral merely to cure the existing disease, without any reference to a preventive quality.

Enlargements of the bones, or ulcers in the throat, are, I believe, very rare consequences of ulcers on the penis, in the Kandyan country; I have not seen a single case labouring under any of these constitutional affections. Several cases of a cuticular eruption, denominated *parangy lede*, have come under my observation. They almost all resembled the "tubercular eruption of syphilitic appearance," described by Dr. Bateman in the 5th volume of the Medico-Chirurgical Transactions.

The eruptions sometimes occurred during the existence of ulcers on the penis, and sometimes after they had healed. In one case, it appeared in a young boy, who had never had connexion with a female. The patients in general stated, that the eruption made its appearance after febrile symptoms of

three or four days' standing. The coming out of the eruption was not immediately followed by a return of health. Pains of the limbs, impaired appetite, languor, and a reduction of strength, continued for some time. For the most part, the eruption appeared first on the face; generally, however, it eventually extended over the body. The protuberances were most numerous on the face, and, next to the face, in the axillæ and groins. Sometimes, after an attack of fever, a fresh eruption occurred before the preceding one had entirely disappeared. The eruption, in some cases, was remarkably protuberant. For the most part the protuberances were circular, from a quarter to a third of an inch in diameter, smooth, and in general they were flattened on the top. After the lapse of an indefinite period, the cuticle which covered the protuberances, burst: a glairy fluid then oozed from the ruptured spot; which, by drying, formed an elevated gray-coloured scab. Some of the large scabs covered spongy granular excrescences. The protuberances did not in any case show a disposition to ulcerate.

The eruption was remarkably uniform in almost all the cases; still, however, there was some variety in its appearance. The circular abrupt rim or edge of the protuberant spots was more conspicuous in some cases than in others. No oozing of glairy fluid took place in several instances, and consequently there was no scabbing.

In one case, the eruption and general symptoms of impaired health resisted the continued use of a great variety of vegetable decoctions, prescribed by a Vederale, for three months. At the end of this period the blue pill was given, which produced ptyalism in about four days. After the lapse of about a week, the protuberances had all disappeared: health returned rapidly.

Several other cases of this kind of eruption were cured by slightly affecting the mouth for only a few days. In three cases which came under my eye, the eruption disappeared

without medicine. The spontaneous recoveries were, however, more tardy than when mercury was exhibited.

The Kandyans know several modes of preparing mercury for internal exhibition. With the two following processes the Vederales are in general well acquainted.

The first of these is by trituration. Quicksilver is triturated with the expressed juice of the leaves of the betle creeper; the powder of aromatic seeds is then added, together with a portion of honey, to form a mass, which is divided into pills. Some of the Vederales recommend that the pills should be swallowed with cream.

The second process is by the action of the muriatic acid. Take of *rasadia* (quicksilver), which is to be put into a small cup, then take two earthen vessels with mouths of equal dimensions; introduce a quantity of common salt into one of the vessels, and sink the cup which contains the mercury, nearly to the brim in the salt; then invert the empty vessel over that which contains the salt and mercury, lute both together and place them for about two hours on a slow fire; at the end of this period the fire is to be increased. The vessels are to be kept over the fire for about fifteen or sixteen hours. By this time the quicksilver will have all sublimed. Remove the vessels from the fire, and give them time to cool: then take out the substance which adheres to the inside of the upper one. This preparation is the *sindooram* of the Tamuls, and the *rasadia basme* (burned mercury) of the Singhalese. The *rasadia basne* is mixed with rice-flour and coarse sugar, and exhibited in bolusses.

Mercury is perhaps more frequently prescribed by the Vederales in the form of vapour than in any other manner. For this purpose a cocoa-nut shell is divided transversely: a small hole is made through one of the sections of the nut: charcoal, in a state of ignition, is put into one of the halves of the nut: *shadelingum* (red sulphuret of mercury) is thrown upon the charcoal, and the perforated half of the cocoa-nut is immediately applied over the other. The person

for whom the fumigation is intended, applies his mouth to the orifice and inhales the vapour.

Fumigation is sometimes performed by throwing cinnabar upon ignited charcoal, and covering the patient with the large leaves of the *habaralla* (arum macrorhizon).

PART II.

ON THE HEALTH OF THE TROOPS, &c.

CHAPTER I.

On the physical Constitution and moral Habits of the different Classes of Troops employed in the Interior; Europeans, Malays, Caffries, Indians—Military Stations—Kandy—Badula—Allipoot—Ratnapore—Fort King—Kornegalle—Barracks—Hospitals—Diet.

The troops employed in Ceylon may be divided into four classes; namely, Europeans, Caffries, Malays, and Indians, or natives of the peninsula of India. Individuals of each of these classes possess a strong physical and moral resemblance; they use the same aliment, have similar wants, they undergo the same labour, and suffer the same privations. Each class has particular prevailing diseases, probably arising from a difference in the physical and moral character, diversity of food, moral habits, &c. The last two classes, like orientals in general, possess a remarkable uniformity of character.

Europeans.—The inhabitants of high latitudes, on their arrival in Ceylon, for the most part, undergo some change, both in their physical and mental functions. Their constitutions become irritable, and easily affected by stimuli. Many of them soon sustain a deviation, more or less, from sound health, accompanied with a certain degree of emaciation. The skin loses the ruddy hue of robust health, and assumes a pale yellowish shade: moderate exercise becomes fatiguing, and the mind indisposed to much application. This observation is, however, liable to a number of exceptions: individuals

of the higher classes, who endure little fatigue, live temperately, and do not expose themselves much to the direct rays of the sun, are not greatly liable to attacks of acute disease. No care, however, can entirely prevent the debilitating influence of the climate, and a tendency to chronic disease of some of the vital organs. Senescence frequently precedes old age at a considerable distance.

Females are not exempted from the exhausting effects of a tropical climate. They in general soon lose the plumpness of health, the countenance becomes sallow, and the general complexion pale and colourless. They rarely enjoy uninterrupted good health.

The fatal diseases which more frequently affect Europeans in Ceylon are, endemic fevers, abscess of the liver, and dysentery. This class of people is greatly exempted from many diseases to which they are liable in their native country.

The daily ration of the European soldier consists of, beef 1 lb. rice 1¾ lb. arrack about 5 oz. and a small quantity of salt. Part of the rice is ground into meal, which is afterwards made into a kind of bread. The meat is for the most part cut into small pieces, and curried. It is then eaten with the rice. In well-regulated corps and detachments, the breakfast of the soldier consists of rice cakes and coffee; dinner, of curried beef and rice; supper, of rice cakes and coffee.

Intemperance is a common failing among British soldiers, in all countries. Every where this destructive habit is followed by very grievous consequences to the health of its votaries. In warm climates it is particularly hurtful. In Ceylon its bad effects are fully felt, on account of the low price for which spirits can be procured. At many stations in the island, arrack is retailed at about sixpence a quart.

The physical and moral evils occasioned by the immoderate use of arrack, must be seen to be duly estimated. Frequent indulgence creates a want which must be supplied. Neither admonition nor example, however melancholy, has sufficient influence to deter the drunkard from persisting

in his old habits. Almost all the punishments which are inflicted upon European soldiers, arise from the direct or indirect consequences of inebriety. European soldiers, who have been long in this country, are nearly all much addicted to hard drinking; indeed, many of them become perfect sots. It is much to be feared, that the regular issue of spirit rations tends to excite a desire for the immoderate use of arrack.

Malays.—The 1st Ceylon regiment is composed of this race. They have been chiefly procured from the islands of Java and Sumatra. A considerable portion of the regiment are natives of Ceylon, but of Malay descent.

The Malays of the 1st Ceylon regiment are beneath the medium height of Europeans*. They have remarkably long spines, and their inferior extremities are generally short, and rather clumsy. They have in general flat chests. In other respects they are stoutly made. Malay children are for the most part very handsome; both sexes, however, become remarkably ill-favoured as they advance in life. While young, the Malay is active and playful; in advanced life he loses his liveliness of manner, and becomes demure, dull, and apparently torpid.

Under careful management, the Malays make good soldiers. They are capable of considerable exertion, and when

* Abstract of the height of a Company of Malays, consisting of 121 individuals.

From 5 feet to 5 feet 1 inch,	No. 1
5—1 — 5—2	11
5—2 — 5—3	21
5—3 — 5—4	24
5—4 — 5—5	27
5—5 — 5—6	17
5—6 — 5—7	11
5—7 — 5—8	5
5—8 — 5—9	3
5—9½	1
	121

the passion for plunder, or vengeance, is raised, they engage in any enterprise with remarkable alacrity. They are provident and tenacious of their rights, yet easily kept under control, by affording them no just cause of complaint, and by mildly but firmly discouraging improper demands. They submit with coolness to military discipline; and when punishment is formally inflicted, I am not aware that they are apt to indulge vindictive feelings towards officers who have been accessary to bringing them before a court martial. They very early assume the appearance of old age. Malays are, in Ceylon, remarkable for longevity.

The daily ration of the Malay is, rice 1¾ lb. In the interior he is allowed ½ lb. of meat. Like the orientals in general, the Malay dresses his food with a variety of spicy condiments. They are habitually temperate, in as far as regards the quality of the articles they eat and drink. Many of those who have been recruited in Java and the neighbouring islands, indulge freely in the inhalation of the smoke emitted from a composition of opium and the prepared leaves of the cannabis sativa *(bang)*. They likewise swallow opium in its pure state, seemingly with a great degree of impunity: many of them swallow occasionlly from twenty to thirty grains daily. The Malays assert, that opium increases the sexual appetite, and strengthens the power of enjoyment. For this purpose it is frequently swallowed. The females sometimes inhale the fumes of the narcotic composition so much used by the males. This practice is not, however, general among the women. In its effects the immoderate use of opium is nearly as hurtful as a habit of swallowing an undue quantity of spirits. Fortunately, the number of great opium-eaters among the Malays is much less than immoderate drinkers among the European troops. Happily, likewise, the high price of opium greatly limits the indulgence of its fumigators.

The excessive and long-continued use of opium impairs the memory, and other mental faculties. Like the dram-

drinking sot, the habitual consumer of opium loses his usual foresight, and becomes indifferent to the good opinion of his officer. The digestive powers are eventually impaired, followed by a total and permanent loss of appetite; great emaciation succeeds, and sometimes death follows at no great distance. But, perhaps, the moral evils that originate from an intemperate use of opium, are more to be deplored than the hurtful effects it has upon the health. Opium is indispensable to those who have indulged in its use to a great degree. To obtain a supply of this favourite drug, the opium-eater will sacrifice the best feelings of human nature, and commit any act, however depraved, which promises to afford the means of indulgence. For this purpose, a Malay will not only dispose of the food provided for his family (for the Malays are almost all married), but he will sell his own clothes, and even those of his wife and children.

Malays are liable to diseases of the chest, particularly to pneumonia; as also to consumption and asthma. They are likewise liable to endemic fever, when exposed to the causes which give rise to it. For the most part, however, the fever which affects them, assumes the intermittent type. Scabies is a frequent affection among recruits recently arrived from Java, &c. In this country scabies is not confined to the hands and wrists so much as it is among the inhabitants of cold climates. It extends over the body and extremities, from the toes to the nape of the neck. The species of scabies which prevails among Malays, is the "pocky itch:" sometimes, although but rarely, they are affected with the other kinds of itch. The pocky itch is frequently followed by deep exulceration.

The females are distinguished for fecundity: the children thrive remarkably well, and eventually contribute materially to recruit the regiment.

Africans (or, as they are more generally termed in Ceylon, Caffries) compose five companies of the 2d Ceylon regiment: they are the remains of the late 3d and 4th Ceylon

regiments. Recruits for these corps were chiefly procured on the eastern coast of Africa, and for the most part in the neighbourhood of Mozambique. A few recruits of this class were obtained from among the domestic slaves of the Portuguese and other inhabitants of the Malabar coast.

Many of the Caffries are stoutly made, and have plump well-rounded extremities; the chest is, however, often confined and flat. They can undergo considerable fatigue, and, when well fed, perform their duty with alacrity. The physical constitution of the Caffrie is lax, and possesses little energy or power of renovation. Mentally he is passive, torpid, and but little disposed to complain. His feelings seem to be naturally obtuse; occasionally, however, he evinces a considerable degree of sensibility. Under disease, when he attempts to describe his sensations of uneasiness, he often fails in convincing his auditors that he suffers much pain. The indifference of his manner, and the unobtrusiveness of his character, together with our limited knowledge of his artificial language (which is very imperfect), renders it frequently difficult for a medical officer to ascertain the real state of his sensations, and of course to form an accurate diagnosis of his disease. His silence, and seeming unconcern while under the influence of disease, are apt to deceive the medical attendant, by occasioning him to under-rate the extent or severity of existing derangements of the system.

The daily ration of the Caffrie is, beef $\frac{3}{4}$ lb.; rice $1\frac{3}{4}$ lb.; and in the interior, arrack about $2\frac{1}{2}$ ounces. Although the Caffrie is fond of spirits, he seldom drinks intoxicating liquors to such a degree as to hurt his health. The love of arrack is not his ruling passion, as it is with Europeans: he is more a gourmand than a drunkard.

Africans are in Ceylon very liable to pectoral complaints, as also to cachectic diseases. Consumption is a very frequent cause of death among them. They are likewise liable to enlargements of the lymphatic glands. There is, in this class of people, often much difficulty in learning, through the me-

dium of the phenomena of disease, the organ or viscus that may be particularly affected, and the extent to which structural derangement obtains. Among the morbid appearances discovered on dissection, great disorganization of the lungs is the most frequent; but, indeed, the extent to which morbid structure is found on dissection (often unexpectedly), is almost incredible: sometimes nearly every viscus in the thorax and abdomen is found in a morbid state, so that it is difficult to assign a particular cause of death, and in what station we ought to place the casualty in the nomenclature of diseases.

There is one remarkable peculiarity in the constitution of Caffries, which is their comparative insusceptibility to the cause of endemic fever. They very rarely suffer by fevers of this kind, even in situations where the cause of fever is proved to be abundant by its destructive influence among other classes of people.

Ceylon appears to have been extremely unfavourable to the health and propagation of Caffries. Not a trace of the many thousands brought to it by the Portuguese colonial government is to be perceived. The same may be said of a colony of Africans, which was imported about the year 1782, by Governor Van de Graaf.

The 3d Ceylon regiment was embodied in 1803, and the 4th in 1810. Until about 1814, they were both corps of considerable strength. In 1815, the 4th was disbanded, and the men transferred to the 3d: this latter corps was disbanded in 1817, and the men incorporated into the 2d Ceylon regiment. There now (December 1820) remain only about four hundred and forty individuals of both the above regiments, including the few Caffrie boys who have been taken on the strength of the corps. I have not been able to learn how many Caffrie recruits were brought to Ceylon for the above-mentioned two corps. In all probability the number must have greatly exceeded four thousand.

With the view of promoting the successive production of Africans in Ceylon, a large proportion of females was always

imported along with the males. The females were allowed a ration of provisions gratis, and each male child had a ration allotted to him from the day he was born. These prudential measures have, however, availed nothing: almost all the children born of African parents, expire before they reach ten or twelve years of age. During early infancy they are plump and healthy; but by the time they reach five or six years of age, they droop, become meager, and generally die before the age of puberty.

This high degree of mortality among the offspring of Caffries cannot be ascribed either to neglect on the part of the parents, or to their being exposed to great hardships. The mothers appear to be very attentive to their children, and except when a detachment moves from one station to another, the Caffrie families are liable to no inconvenience. The children of indigenous females, by a Caffrie father, are as liable to disease, and thrive as badly, as the pure descendants of Africans. This mixed breed generally die at a still earlier age than the offspring of Caffrie females.

Indians.—Five companies of the 2d Ceylon regiment, the corps of gun Lascars, and the pioneer corps, are composed of natives of India. They have been chiefly procured from the Madras presidency. Individuals of this class are in general delicately made, with slender but agile limbs. Although the frame of the Indian is rarely robust, and his habits in general sluggish, he may be excited to considerable exertion by mild treatment, and a due attention to his wants and prejudices. He is sober, temperate, submissive, and easily governed. Indians are proverbially attentive to their very near relations; in other respects the feelings and the wants of their associates give them no concern.

The daily ration of the Indian consists of $1\frac{1}{4}$ lb. of rice, and a small portion of salt. The rice is dressed, and eaten with a variety of spicy condiments, to which ghee (clarified butter) is generally added. Fresh fish is particularly prized by the Indians. When they are stationed on the coast, where

this article is comparatively cheap, it frequently forms part of their food.

The Indians are not deficient in mental capacity, but they have an unconquerable attachment to early habits, however absurd, and a determined aversion to every new mode of action, however beneficial; which, in many instances, must have an unfavourable influence upon the health. Numerous instances might be stated where their inveterate customs have a tendency to occasion sickness. One may be mentioned, namely, their extreme inattention to provide against great vicissitudes of temperature; partly arising from the habit they have of sleeping upon the ground: a thin mat is, in general, all that intervenes between their bodies and the earth; and the only covering they have during night is the cotton cloth which encircles the loins during day. Many of them prefer sleeping in the open air to enjoying a tolerably comfortable lodging. So inveterate are their customs in regard to sleeping upon the ground, that, in hospitals, where bedsteads happen to be provided for their accommodation, individuals are often found to have left their beds and slept during the night on the ground.

The diseases of this race are comparatively very simple. Intermittent fever is frequent among them where the causes of fever prevail. Wet or variable weather tends much to increase their liability to fever. Under great transitions of temperature they are likewise subject to active inflammation, particularly of the lungs and intestines. Natives of the southern extremity of the peninsula of India are extremely liable to scabies; indeed, few of them are entirely exempted from it. In Ceylon, scabies obtains the name of "Malabar," on account of the frequent occurrence of that disease among the natives of the Malabar coast, or western side of the peninsula. This disease and its ulcerative consequences tend greatly to increase the sick list of corps composed of Indians. The habits of Indians are extremely filthy.

The Indian has but little fortitude under disease. He complains without appearing to have an adequate cause for

his loud expressions of suffering. While his mind wants fortitude, his physical frame seems frequently to possess but a very moderate share of the principle of resistance to the inroads of disease, and of the powers of renovation. Life is often extinguished rapidly without much apparent disease. The mere pain of an irritable ulcer has sometimes appeared to occasion death.

Military Stations.

In a medical point of view there is a remarkable similarity between the local aspects of the different posts in the interior. Indeed, a garrison or post is for the most part a mere speck in the middle of an exuberant jungle, which requires frequent repression to prevent a gradual encroachment upon the occupied spot. The incessant verdure of the vegetable kingdom in Ceylon spreads a dense umbrageous covering over almost every part of the country. The immediate neighbourhood of the larger garrisons is as completely over-run with underwood and large trees as that of the smaller posts. In these extensive forests there is a quick reproduction of plants, and, consequently, a constant and rapid decay of vegetable matter. There is, therefore, in the vicinity of all the posts, much of the component parts of vegetables in a state of decomposition, and, in as far as this circumstance contributes to occasion insalubrity, evidences of its influence may be expected.

During the years 1815, 1816, and 1817, the principal posts occupied in the newly-acquired provinces were Kandy, Badula, and Amnapoora. These were likewise hospital stations. The campaign in 1818 occasioned a great increase to the number of posts, both on the hills and upon the surrounding level country. Even long after the cessation of hostilities, the number of small garrisons was very great. In January 1819 they amounted to about fifty, including posts of all

kinds. This number has, however, been gradually reduced: there are now (December 1820) thirty-two posts occupied in the interior.

Since the termination of the insurrection, the chief posts occupied have been Kandy, Badula, Allipoot, Ratnapore, Fort King, and Kornegalle. These are all hospital stations. Each of these posts has smaller ones, depending upon it. The first three are situated upon the interior terrace; the latter three are below the hills.

The town of Kandy is 88 miles distant from Colombo, and is elevated 1400 feet above the level of the sea. It is situated upon a small flat, which is surrounded by a ridge of hills, for the most part thickly overgrown with trees and low underwood. The area of the plain upon which the town stands is about half a mile. In dry weather the power of the sun within the amphitheatre of hills is very great: the mornings and evenings are, however, in general cool and pleasant.

The troops are in part quartered in one of the streets of the town; the remainder are cantoned upon the acclivity of the encircling hills.

Badula is distant from Colombo, by the way of Kandy, 143 miles, and is situated about 2100 feet above the level of the sea. The fort is constructed upon an insulated spot of ground, slightly elevated above the surrounding flat, and completely embosomed in high mountains. The diameter of the area between the mountains is about two miles. The Badula oya, a pretty large river, runs in a winding direction within the hills, and nearly encircles the valley in which the fort stands. The valley is cultivated with rice, and yields two crops annually. Water is conducted from the river to irrigate the flat that surrounds the fort. When the rains are heavy, the river overflows its banks and inundates the valley.

Allipoot (New) lies about 15 miles east from Badula. It is less elevated than the latter post, and stands upon the range of hills which form the eastern rampart of the interior terrace. The country round the post is destitute of trees, and thickly

overgrown with tall grass. Immediately below it lie the low woody flats of Lower Oowa.

Ratnapoora stands upon the bank of the Caloo-ganga (Caltura river), and is about 50 miles from its mouth. The river is navigable for small craft as far as the post, which is supposed to be about 200 feet above the level of the sea. The post is situated almost immediately below the western aspect of the mountainous rampart of the upper country. Adam's Peak forms a part of this rampart, and overlooks the low country upon which Ratnapoora is situated. The neighbourhood of this post is covered with jungle. The prospect towards the hills is here remarkably picturesque. Ratnapoora is distant from Colombo 57 miles.

Fort King (formerly Attapitty) is about 545 feet above the level of the sea, and 66 miles from Colombo. It is situated about 4 miles to the westward of the rampart of the upland terrace which faces the west. This post is beautifully placed upon a small hill, close to the bank of a river: at this station the river has a rapid course. There are few swampy spots, either cultivated or uncultivated, in the neighbourhood of Fort King. Much labour has been expended to clear a small portion of the country around the post of the jungle and tall trees which grow there with great luxuriance. This cleared spot is therefore destitute of trees, and covered with rich pasture.

The post of Kornegalle is situated upon a flat tract of country which stretches along the western shores of the island. In breadth this comparatively flat tract is about 55 miles. Kornegalle stands about 40 or 45 miles directly inwards from the sea. It is about 50 miles from Colombo. The probable height of the site of the post above the level of the sea is about 360 feet. There is a much greater proportion of cultivated land in the seven Korles (the district in which Kornegalle is situated) than in any other division of the Kandyan provinces. The flatness of the surface favours rice cultivation. Many of the cultivated tracts are thickly interspersed

with dense jungles. During wet weather, large portions of this flat are half inundated: the soil is, therefore, frequently marshy. For the purpose of fertilization, the cultivated fields are all irrigated. The air is frequently hot and sultry. Hitherto the troops have been tolerably healthy at this post.

The site of Kottadinia lies upon the same flat as Kornegalle, and is situated about 13 miles from the latter post. In respect to climate, these two places appear to be very similar. Kottadinia was found to be extremely unhealthy in 1803. Mr. Cordiner informs us that seventy-five men of the grenadier company of the 65th regiment marched to this post towards the middle of the month of March: he adds, "Every individual of the party was seized with the fever;" "and, at the end of one month from the commencement of his march, Lieut. Hutchins and two privates were the only persons of the party who remained alive."

The barracks of the interior are, for the most part, temporary mud buildings, thatched with grass, paddy straw, or cocoa-nut leaves. The Europeans sleep upon wooden bedsteads or platforms. Each man is allowed a blanket. No other articles of bedding are furnished by the public.

The Caffries, Malays, and Indians, are not provided with bedsteads; they sleep upon mats spread on the ground. These three classes of troops are not furnished with blankets.

The hospitals in Kandy, Badula, and Fort King, are substantial buildings, and very conveniently situated. In the other stations the hospitals are temporary buildings, and much less commodious. The sick sleep upon wooden platforms, without paillasses. In Kandy they are furnished with rattan-bottomed bedsteads. Europeans and Caffries are in hospital provided with sheets and blankets, and each man is furnished with a flannel or serge bed-gown. In other respects the sick wear their own clothes. Malays and Indians are not supplied with sheets and blankets in hospital.

The interior economy of the hospital for Europeans and Caffries is conducted nearly in conformity with His Majesty's

regulations regarding regimental hospitals. To avoid interfering with the prejudices of the Malays and Indians respecting diet, they are not furnished with provisions in hospital. The stoppage made from the pay of these two classes while in hospital is therefore very small, about seven eighths of a penny per day. This stoppage is, in general, found adequate to supply the few cordials which they require.

The state of the markets in the Kandyan country may in some measure be inferred from a slight consideration of the habits and customs of the inhabitants. Their own wants being extremely limited, they cultivate scarcely any thing for sale, which could contribute to the comfort of soldiers. Almost every article of food required, in addition to the ordinary ration, must therefore be procured from Colombo or some other station on the sea-coast. Hence the troops labour under privations, partly in proportion to the distance they are stationed from the maritime provinces. The diet of the soldiers is, for these reasons, comparatively very uniform. The bazars of the interior have hitherto furnished little variety, at a rate within the compass of a soldier's pay. Fowls are to be procured at most of the stations, but they are in general so dear as to be beyond the means of a soldier to purchase them. The chief, indeed almost the only culinary vegetables which the Kandyan bazars afford are brinjauls (a species of melangona) and sweet potatoes. The plantain is almost the only fruit a soldier is able to purchase.

Bread is very high-priced in the Kandyan country. Even in the town of Kandy, where the demand is the greatest, a coarse kind of bread sells at seven-pence per pound. But bread is prepared at only four stations in the interior: it therefore cannot be procured at many of the dependant posts. To new arrivals the want of bread is a great privation.

CHAPTER II.

On the Employment and Health of the Troops from 1815 *to* 1820, *inclusive; with annual Tables of the Mortality, and Returns of the Numbers admitted into Hospital, &c.*

TOWARDS the end of the year 1814, the Colonial Government evinced a disposition to invade the territory of the King of Kandy. The troops were for some weeks held in readiness to march at the shortest notice, and much exertion was made to provide an adequate commissariat to accompany them to the field. The repeated failure of the Portuguese and Dutch in their attempts to subjugate the Kandyan country, and the result of our own unsuccessful irruption in 1803, tended to make an inroad into the interior appear to be a measure of considerable importance. The Portuguese and Dutch had represented the country as extremely insalubrious, and hostile to a European constitution. This character of the Kandyan territory was supposed to have been amply confirmed by the dreadful prevalence of endemic fever among the British troops employed there in 1803, and the mortality that it occasioned. The service was therefore apparently one of much danger, and could not be expected to be extremely desirable. These discouraging circumstances had, however, no influence upon the troops. They moved from their respective stations with an eagerness and alacrity which did them the highest credit.

In the month of January 1815, or early during the succeeding month, the troops destined for this service marched in seven divisions from the garrisons on the coast towards the enemy's country. The first division crossed the Kandyan limits at Avissahavella, on the 11th January. The farther advance of it was retarded in consequence of some of the other divisions not having then marched, it being intended that the

concentration of the troops in the neighbourhood of Kandy should be nearly contemporaneous. On the 13th of February the first division encamped in the suburbs of Kandy, and shortly after four more divisions arrived. The advance of the other two divisions was countermanded.

The King of Kandy was made prisoner on the 18th February. This very important event led to the submission of the chiefs, and to a termination of hostilities. The great body of the troops employed was speedily remanded to stations on the coast. Garrisons, with small dependant posts, were established in the newly-acquired territory, at such positions as were deemed advisable. During the progress of the troops they underwent considerable fatigue, as well as some privations. A few of the divisions were but badly supplied with tents; many of the men were, therefore, under the necessity of sleeping in the open air, exposed to the chilling dews of the night. Very fortunately the troops that marched from the garrisons on the western side of the island were not incommoded with rain. The division which moved from Batticaloe had very bad weather, and this was the only division which had any considerable number of sick. The sickness of the men of this division was evidently occasioned by exposure to variable weather and privations in regard to food. The rain had destroyed great part of their stock of rice, and no substitute for this important article of sustenance could be procured.

Hospitals for the accommodation of the sick were promptly established at Kandy, Badula, and Amenapoora.

The post of Minery alone was remarkable for insalubrity. This small post stood upon the road which leads from Trincomale to Kandy. The buildings constructed for the accommodation of the troops were placed in the immediate vicinity of a large artificial tank, generally known by the name of the Minery Lake. This extensive lake is situated in the flat country which stretches from the mountains of the interior to the sea. The wind from the south-west (or, as it is there call-

ed, the land wind) blows very strong at Minery, during the months of May, June, and July. The post was occupied in February, and it continued healthy until about the end of April. The months of February and March were wet, during which time not a case of fever occurred. When the dry weather set in, fevers became prevalent. There being no medical officer at Minery, the sick were transferred to Trincomale, a distance of about sixty miles. On account of the violence of the prevailing disease, the distance from the hospital, and the imperfect means of conveyance, the sick reached Trincomale in a very deplorable condition. The insalubrity of the post not appearing to abate, the men were withdrawn about the end of June, and the position abandoned.

The 19th regiment had fifty-three individuals, of different ranks, exposed to the influence of the climate of Minery. They were all attacked with fever: thirty-three died either upon the road, or shortly after they reached the hospital. Fourteen survived the fever, but with greatly impaired constitutions. Six recovered.

The artillery had thirty-three men exposed to the above climate. They were all attacked with fever; eleven died.

Until the establishment of hospitals in the interior, the sick of the troops were transferred to the coast, chiefly to Colombo. The hospital returns commence from the 1st of May. Annexed is a statement of the casualties which occurred among the troops employed in the Kandyan country, including those which happened among the sick transferred from Minery to Trincomale, from 1st May to 31st December 1815.

Europeans.—Under this head in the subjoined Table, I have included Europeans of all ranks belonging to the troops.

Malays.—This class comprehends the native officers, non-commissioned officers, and privates, of the 1st Ceylon regiment.

Caffries.—This head includes the Africans employed in the Kandyan provinces.

Indians.—This class is chiefly composed of natives of the

peninsula of India, and includes the Seapoys of the 2d Ceylon regiment; the gun Lascars attached to the ordnance department; and the pioneers employed in the interior.

Table, showing the Strength of the Troops employed in the Kandyan Country, the Diseases which proved fatal, the Number of Deaths, and the Proportion of Deaths per Cent. from the 1st May to the 31st December 1815.

Class.	Average Strength.	Diseases, or Cause of Death.					Number of Deaths.	Proportion of Deaths per Cent.
		Endemic Fever.	Phthisis Pul.	Dysenteria.	Beriberi.	Found dead.		
Europeans	350	55	—	3	—	—	58	$16\frac{1}{2}$
Malays ..	268	1	—	—	—	—	1	1 in 268
Caffries ..	532	—	3	7	1	1	12	2 nearly
Indians ..	683	—	8	6	—	—	14	$2\frac{1}{5}$

1816.

The occurrences of this year in regard to the health concerns of the troops, give but little occasion for remark. They were not much exposed to hard duty. A few of the Europeans and Caffries were employed in constructing roads, and fatigue duties of a similar kind.

The annexed statement will show the amount of the mortality among the different classes of troops, according to the returns. This statement is not an absolute account of the casualties which occurred among the troops employed in the Kandyan provinces, inasmuch as the casualties that happened among the sick transferred to Colombo for the benefit of change of climate, are not included. The number transferred was not, however, great.

Table, showing the Strength of the Troops employed in the Kandyan Provinces, the Diseases which proved fatal, the Number of Deaths per Cent. of the whole Number, from the 1st January to 31st December 1816.

Class.	Average Strength.	Diseases, or Cause of Death.																	Number of Deaths.	Proportion of Deaths per Cent.
		Endemic Fever.	Pneumonia.	Hepatitis.	Phth. Pulmon.	Dysenteria.	Apoplexia.	Dyspepsia.	Tetanus.	Cholera Morbus.	Mania.	Hydrothorax.	Ascites.	Beriberi.	Barbier, or Beriberi.	Syphilis.	Hernia.	Varii *.		
Europeans	398	1	—	3	—	3	—	5	—	1	—	—	—	1	—	1	—	1[a]	16	4
Malays ..	96	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	2	2
Caffries ..	761	1	2	3	4	7	1	4	1	—	—	2	—	1	1	—	1	3[b]	31	4
Indians ..	531	2	—	1	1	5	—	—	—	—	2	1	1	—	—	—	—	1[c]	14	$2\frac{3}{5}$

* [a] Drowned. [b] 2 Drowned—1 Murdered. [c] Drowned.

1817.

For the first nine months of this year the troops were chiefly employed in the common garrison duties of the different stations: some of the Europeans were employed as artificers and labourers. While thus engaged, they were of consequence occasionally exposed to the direct rays of an ardent sun: in other respects they were not much liable to the exciting causes of disease.

About the end of May, a number of severe cases of dysentery occurred among the Europeans. This disease appeared nearly at the same time in the three principal posts of the interior, namely, Kandy, Badula, and Amenapoora. Dysentery prevailed during the months of June and July: very few new cases occurred after this period. There was nothing remarkable in the state of the weather while dysentery prevailed.

Towards the middle of October the troops were called into the field to quell an insurrection of the inhabitants of the districts of Vellasse and Oowa. This being the period when the monsoon changes, the troops were greatly exposed to the heavy rains which accompany the setting in of the north-east monsoon. The nature of the duties required of the troops by the exigencies of the service, was very fatiguing, and almost incessant. It is, however, worthy of remark, that notwithstanding the privations the men underwent, the bad weather to which they were exposed, and the fatigue they endured, there was but little disease among them.

Annexed are two Tables of the casualties which occurred among the troops during the year. The first Table shows the average strength, the diseases which proved fatal, the number of deaths by disease, the number killed in the field, the proportion of deaths per cent. of the whole strength, and the number of bodies inspected after death. The chief design of the second Table is to show the periods of the year when certain fatal diseases more or less frequently occur.

TABLE, N° 1,

Showing the Strength, Casualties, &c. of the Troops, from 1st *January to* 31st *December* 1817.

1817.	Mean Strength.	Diseases, or Cause of Death.																Number of Deaths by Disease.	Killed in the Field.	Total of Deaths.	Proportion of Deaths per Cent. of the whole Number.
		Feb. Cont. Commun.	Feb. Remittens.	Pneumonia.	Gastritis.	Enteritis.	Abscess of the Liver.	Phthisis Pulmon.	Phth. Pulmon. combined with Induration of the Liver.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria combined with Induration of the Liver.	Dysenteria with morbid Softness of Liver.	Atrophia.	Beriberi.	Icterus.	Contraction of the Colon.	Intus-susceptio.	Accidents.				
Europeans	564	1	3	—	—	—	3	—	—	9	9	2	1	—	1	—	1	—	—	30	7	37	6½
Number of Bodies inspected	—	1	2	—	—	—	3	—	—	9	9	2	1	—	1	—	1	—	—	—	—	—	—
Malays	287	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	10	11	4 nearly
Number of Bodies inspected	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Caffries	638	—	—	—	—	—	—	7	1	2	—	—	—	—	—	—	—	1	2	13	13	26	4
Number of Bodies inspected	—	—	—	—	—	—	—	7	1	2	—	—	—	—	—	—	—	1	1	—	—	—	—
Indians	729	2	—	4	2	1	—	—	—	1	—	—	—	2	—	1	—	—	—	13	18	31	4
Number of Bodies inspected	—	2	—	3	1	—	—	—	—	1	—	—	—	2	—	1	—	—	—	—	—	—	—
																			Total	57	48	105	

TABLE, No 2,

Showing the Months in which the Casualties occurred.

1817. Date.	Class.	Diseases, or Cause of Death.																Total Deaths by Disease.	Killed in the Field.	Total.
		Feb. Cont. Com.	Feb. Remittens.	Pneumonia.	Gastritis.	Enteritis.	Abscess of the Liver.	Phthisis Pulmon.	Phthisis Pulmon. with Induration of the Liver.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria with Induration of the Liver.	Atrophia.	Beriberi.	Icterus.	Contraction of the Colon.	Intus-susceptio.	Accident.			
January ..	European .	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	2	—	2
	Malay ...	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
	Caffrie ...	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
February .	European .	1	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	3	—	3
	Malay ...	—	—	—	—	—	—	2	1	—	—	—	—	—	—	—	—	1	4	—	4
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
	Indian ...	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
March ...	European .	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	2	—	2
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	2	—	2
	Indian ...	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	2	—	2
April	European .	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
	Malay ...	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
	Indian ...	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
May	European .	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	1
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	1
June	European .	—	—	—	—	—	—	—	—	5	2	1	—	—	—	—	—	—	8	—	8
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
	Indian ...	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
July	European .	—	—	—	—	—	1	—	—	1	4	—	—	—	—	—	—	—	6	—	6
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	1
	Indian ...	2	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	4	—	4
August ..	European .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	1
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
September	European .	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	2	—	2
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	1
October ..	European .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
November	European .	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—	2	1	3
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
	Caffrie ...	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	2	1	3
	Indian ...	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1
December	European .	—	3	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	4	5	9
	Malay ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8
	Caffrie ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8
	Indian ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	17
																		Total	57	48	105

The Tables of Casualties for this and the subsequent years, were compiled from the Monthly Sick Returns, forwarded to me by the medical officers in charge of sick. Along with the numerical monthly return, medical officers were instructed to transmit the clinical history, treatment, and appearances on dissection of every case that terminated fatally under their care, during the period included in the returns.

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1818.

During the early months of the year, the spirit of disaffection extended over the greater part of the Kandyan country: the exertions of the troops became, in a greater or less degree, necessary, in every district of the newly-acquired provinces. For the purpose of suppressing the turbulent commotion of the inhabitants, the troops were almost incessantly in motion. They were therefore much harassed by hard duty, frequently exposed to bad weather, and liable to many privations. A chief part of their duty was to follow the disaffected into their fastnesses, for the purpose of seizing or dispersing them, and to destroy the cattle and articles of subsistence which had been there collected. Another essential part of their duty was to convey military stores and provisions from one station to another. In the performance of these duties, the troops underwent much fatigue; they had frequently to climb high and rugged hills, and to wade through deep mountain torrents. In addition to the bodily labour endured upon these expeditions, the men were often greatly exhausted from long fasting.

On account of the closeness and almost impenetrable nature of the country, the troops were greatly exposed to the missile weapons of the enemy. In general, the pathways were so narrow and rugged that the men were obliged to march in single file. A large flank was thus presented to the insidious enemy, who lay concealed in the woods that bordered the defiles through which the troops had to pass: from this place of security the lurking Kandyan could, without much endangering himself, greatly annoy escorts and troops as they moved along the pathways.

For the purpose of surprising the disaffected chiefs and small hordes of the enemy, it was, from the beginning of the insurrection, necessary that the military parties should march under the cover of night. On account of the activity of the enemy, and the hurtful effect of his missile weapons, it was

eventually deemed advisable that the ordinary plan of marching troops, conveying stores, and transporting sick, by day, through the disaffected part of the country, should be abandoned, and an attempt made to perform these operations under the obscurity of night. The Kandyans rarely evinced a disposition to annoy the troops after sunset.

By marching during night, fewer casualties occurred by the enemy. The labour and long-protracted fatigue of the troops were, however, greatly increased. This may easily be conceived, when we contemplate the ruggedness of the country, and the impracticable nature of the pathways. In addition to the natural impediments which occurred, such as deep rivers, rugged precipitous roads, morasses, &c. the Kandyans constructed many artificial means of obstruction *. They often evinced considerable ingenuity in the fulfilment of this design. The progress of troops and escorts was therefore extremely slow during night. They seldom could effect above a mile in an hour. Frequently, it was impossible for the escorts of provisions and stores to cross the mountain torrents in the obscurity of night. When this happened, the men were obliged to halt, and to lie down upon the damp grass, exposed to every variety of weather. The chilly dews of night were, no doubt, fertile sources of disease; but they

* In the pathway along which the troops had to march, they frequently dug pits, and placed pointed stakes in the bottom of them. The mouth of the pit was slightly covered with branches of trees and light sods, for the purpose of concealing the trap. Sometimes they placed bows and arrows along the side of the pathway. The arrow was discharged when a passenger touched a withy, which communicated with the bow. At other times, large stones were placed upon trees, whose branches overhung the road. By touching a withy which lay on the pathway, the stones were discharged upon the passengers. Sometimes young trees were bent near to the ground, and slightly secured in that position. When a concealed withy was touched by an unwary soldier, the tree regained its natural position with a force proportioned to its strength, thereby injuring whoever happened to be within its influence.

were perhaps less injurious than exposure to much rain, and remaining long in wet clothes.

Scarcity of food was severely felt at a number of the stations. Around many of the posts the country was a complete wilderness; not an article of sustenance could be procured, either for money or by force. The means of transporting commissariat stores were often very limited. Hence the ration, in many of the posts, was greatly reduced. Paddy, the unhusked grain from which rice is obtained, was very frequently issued to the troops in lieu of rice.

In consequence of the difficulty of procuring an adequate number of coolies, the means of conveying sick were often deficient. On this account they were sometimes unavoidably detained, for a longer or shorter period, at the dependant posts, and thereby deprived of the advantage of medical assistance during the early stage of disease. The narrowness and rugged state of the pathways rendered it often necessary to adopt an uncomfortable mode of conveying sick, which was to fix both ends of a cumley (an Indian blanket) to a bamboo. The man was put into the cumley, and carried, by means of the bamboo, upon the shoulders of two coolies. This was a very inconvenient mode of conveying men who were wounded.

In the above manner the troops of all classes were employed, until about the beginning of November. The most active of the disaffected chiefs were taken on the 31st of October, when the insurrection terminated.

Much sickness was the result of these exhausting efforts and privations. Indeed, it was impossible for men long to endure with impunity, in any climate, the accumulated hardships and privations to which the troops were almost constantly exposed.

There was no very remarkable increase of disease among the troops in the neighbourhood of Kandy, until about the middle of March. The augmentation of the sick list, at this time, arose in a particular manner from the great prevalence of extensive sloughing ulcers, chiefly of the lower extremities.

This intractable disease affected, in different degrees, all classes of the troops. The Europeans were primarily the greatest sufferers: eventually the natives of the peninsula of India were its chief victims. The Malays and Caffries suffered comparatively but little from this complaint.

The troops stationed in and near to Badula suffered likewise from sloughing ill-conditioned ulcers, and nearly about the same time as in Kandy. They were not, however, so general among the troops in the former station as in the latter. At the hospital of Kandy, one fifth of the European patients admitted during the year was on account of ulcers; whereas in Badula the proportion was only one in ten.

The prevalence of sloughing ulcers, among Europeans, declined about the end of June: not many cases occurred after this period. The Indians continued to be very great sufferers by this complaint through the whole year.

Fever became prevalent among the detachments in Lower Oowa towards the end of March; and during the succeeding month, the troops employed in the province of Walapanē became almost universally sufferers, either from fever or dysentery. Several of the posts in this district were abandoned in the month of May, on account of the sickness of the troops. Still, however, many insalubrious posts were occupied, and fever and dysentery prevailed to a very great degree. These diseases appeared among the troops that occupied posts formerly deemed healthy. Indeed, the men in none of the stations escaped the influence of the cause of fever; but as the exigencies of the service required a frequent interchange of troops, it became very difficult to estimate how far one district exceeded another in the endemical causes of disease. On the interior terrace, I think we may, in a very great degree, attribute the prevalence of fever and dysentery to extreme fatigue; to great and sudden transitions of temperature and varieties of weather, the men being often long under the influence of the sun by day, and much exposed to the cold chilly dews of night; to frequently walking and sleeping

in wet clothes; to the scantiness and bad qualities of provisions; to frequent long fasting; depressing moral impressions; to hardships of various kinds; and to great privations of the ordinary comforts belonging to the condition of a soldier. The endurance of these hardships eventually debilitated the constitution of the men, thereby augmenting their sensibility to the influence of the causes of endemic fever, which perhaps abound more or less in some seasons or states of weather, in all tropical, and particularly in all uncultivated jungly countries, where the temperature of the atmosphere, in the shade, ranges between 80° and 90° of the thermometer.

These observations are intended to apply principally to the prevalence of disease among the troops upon the hills. With regard to the insalubrity of the flats, and particularly the flats on the east side of island, much may be attributed to the unwholesomeness of the atmosphere, aggravated no doubt by predisposing and exciting causes. The deplorable mortality which happened among the men stationed in the district of Vellasse, proves how destructive to human life the atmosphere of these woody flats is in some seasons.

Kottabawa is the chief post in the province of Vellasse. It was one of a line of posts that connected Batticaloe with Badula. This line led through the low flat country that extends without much interruption from the high hills which form the eastern rampart of the interior terrace, to the sea. Kottabawa was an hospital station, and the sick of the dependant posts were there accommodated. No remarkable degree of sickness occurred among the troops on this line previously to about the 10th of July. The month of June had been excessively hot, and the air dry. A hot wind blew from the north, which parched and withered vegetable life. This kind of weather continued without much melioration until about the middle of October. The supervention of an arid condition of the atmosphere was followed by much disease; fever became general, I may almost say universal. The consequent mortality was exceedingly great. The number of Europeans

which was exposed to the climate of Vellasse, from the 12th July to the 20th October, amounted to two hundred and fifty-four; only two of this number escaped fever, the commanding officer and Assistant-surgeon Hoatson*. The amount of the casualties which occurred may be thus briefly stated:

Number attacked with fever		252
Died of this number in Vellasse	79	
The remainder, namely, 173, were transferred as under stated. The last of the transfers left Kottabawa on the 20th October.		
114 from the hospital at Kottabawa to Batticaloe; of these died	74	
16 from ditto to Allipoot and Badula; of these died	12	
43 were transferred to Batticaloe, or Allipoot, without having been admitted into hospital at Kottabawa. I have not therefore been able to ascertain how many of these transfers died. A considerable number of them were men who sunk under the influence of fever while on escort duty between Batticaloe and Allipoot, and who proceeded direct to one or other of these stations. Presuming, however, that the proportion of deaths was equal to the mortality which occurred among the transfers from the hospital, the amount will be	28	
173	Total deaths	193
Probable number discharged from the hospitals ...		59

The constitutions of all those discharged must have been greatly impaired.

While fever was making such ravages among the Europeans at this post, a detachment of Caffries, consisting of

* The commanding officer's health being much impaired, he was recommended to return to Europe. He embarked at Point de Galle in March 1819, and died on the passage home.

about 60 individuals, continued healthy. The indigenous inhabitants of Vellasse suffered much by fever during the endemic. It was impossible, however, to ascertain the extent.

At this period a circumstance occurred by which it was shown, that the susceptibility of particular individuals to the cause of fever varies considerably. On the 10th of September, a detachment of the 73d regiment, consisting of 33 individuals, including a commissioned officer, joined the post at Kottabawa from Trincomale. They were all attacked with fever, and according to the following dates:

On the 21st	Sept.	6 including the commissioned officer.
22d	———	6
23d	———	3
24th	———	4
25th	———	7
26th	———	2
28th	———	2
6th	October	2
8th	———	1
		33

Fifteen of the above number expired at Kottabawa by the 20th October.

The cause of fever was likewise extremely active at Minery. In October, a detachment consisting of 26 men belonging to the 86th regiment, was sent from Trincomale to occupy a position in the neighbourhood of the Minery lake. Not one of this number escaped fever or dysentery. They were all transferred sick to Trincomale: the degree of mortality I have not learned; according to report it was very great.

The fate of a detachment of the 86th regiment, that passed through Vellasse in October, is another proof of the insalubrity of the climate of that district at some periods. The detachment left Batticaloe late in September, 192 strong, and without a single man sick. It passed through Kottabawa early in October, on its way to Oowa. Towards the middle

of the same month, many of the men were seized with fever. The first death happened on the 20th of October. By the 20th of December 125 men of the detachment had been attacked with fever or dysentery, and 29 had expired. At this date there were about 30 men in hospital, suffering severely under one or other of these diseases.

In the following Table I have stated the number of commisioned officers belonging to four regiments employed in the field, the number of deaths by fever, the number wounded, together with the number killed, during the year 1818.

Corps.	No.	Attacked with Fever.	Died of Fever.	Wounded.	Killed.
19th regiment	19	13	4	1	0
73d ditto	28	16	6	0	1
1st Ceylon	29	17	8	3	1
2d ditto	21	16	3	3	0

The subjoined Tables are rather a relative than an absolute account of the casualties which occurred among the different classes of troops. I have, notwithstanding, omitted no opportunity of making them as comprehensive and accurate as possible. Some casualties may, however, have escaped me. In regard to the strength, I believe it is pretty accurate. The Tables are interesting, by showing distinctly the nature of the fatal diseases to which each class of people is more particularly liable. On account of the difficulty of obtaining correct returns of the strength and casualties of the Honourable Company's native troops employed in Ceylon during this year, I have not included them in the following Table.

By Table No. 1, it appears, that 415 Europeans died in consequence of disease in the Kandyan country, or were killed in the field. To this number may be added 74 deaths, being the casualties which occurred among 114 transfers sent from Vellasse to Batticaloe: the number will then be 489. During the year, 543 Europeans under disease were trans-

ferred from the hospital at Kandy to Colombo. The proportion of deaths in this number I estimate at 28, or one in 19, which is the ratio of deaths in the whole number treated in the hospital of Kandy. The general amount will then be 517, or a little more than 27 per cent. of the whole strength. This statement does not include the casualties that occurred among the transfers from Lower Oowa to Hangbangtotte, which were at one time very numerous, the transfers from Minery to Trincomale, nor from Kornegalle and other stations on the west side of the island to Colombo. The loss of Europeans, during the year, cannot therefore be estimated under 30 per cent.; in all probabilty it was more.

Along with the Tables I have given an abstract of the monthly returns of European sick, treated in the hospitals of Kandy and Badula, from the 21st December 1817 to the 20th December 1818. They are the two principal hospital stations in the interior. These returns are interesting, by showing the diseases which occurred during the above period, and the proportion of deaths to the number treated.

TABLE, N° 1,

Showing the Strength, Casualties, &c. of the Troops, from 1st *January to the* 20th *December* 1818.

1818.	Average Strength.	Diseases, or Cause of Death.																															Number of Deaths by Disease.	Killed in the Field.	Total Deaths.	Proportion of Deaths per Cent. of the whole Number.
		Endemic Fever.		Feb. Cont. Com.		Abscess.		Pneumonia.		Gastritis.		Enteritis.		Hepatitis.		Abscess of the Liver.		Phthisis Pulmon.		Phthisis Pulmon. combined with Abscess of the Liver.		Dysenteria.		Dysenteria combined with Abscess of the Liver.		Dysenteria combined with Softness of the Liver.		Dysenteria, with an Enlargement and softened Structure of the Liver.		Dysenteria, with morbid Structure of the Liver.		Dysenteria combined with Abscess of the Liver and Hydrothorax.		Tetanus.		Apoplexia.		Epilepsia.		Asthma.		Hydrothorax combined with Abscess of the Liver.		Anasarca.		Ascites.		Syphilis Consecutiva.		Vul. Sclopetar.		Vul. Sagittæ.		Ulcus.		Accidents.		Found Dead.		Drowned.		Suicide.				
Europeans	1915	253	–	1	1	1	1	4	8	1	1	86	16	1	2	1	1	2	–	–	–	1	–	5	1	–	2	2	1	1		393	22	415	$21\frac{2}{5}$
Bodies inspected	–	166	–	1	–	1	–	3	8	1	1	73	16	1	2	1	1	2	–	–	–	1	–	4	1	–	–	–	–	–		–	–	–	–
Malays . . .	878	31	1	–	–	–	–	–	–	–	–	13	–	–	–	–	–	1	2	–	–	1	–	1	–	–	–	–	–	–		49	19	68	8 nearly
Bodies inspected .	–	2	1	–	–	–	–	–	–	–	–	7	–	–	–	–	–	1	2	–	–	1	–	1	–	–	–	–	–	–		–	–	–	–
Caffries . . .	568	–	1	1	2	–	1	–	2	2	–	4	–	–	–	–	–	–	–	1	–	–	1	3	–	–	–	–	–	–		22	4	26	$4\frac{2}{5}$ nearly
Bodies inspected .	–	–	1	–	1	–	–	–	2	2	–	2	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–		–	–	–	–
Indians . . .	945	7	–	–	1	–	1	–	–	1	–	26	3	–	–	–	–	–	–	–	–	2	–	2	–	3	–	–	–	–		49	13	62	$6\frac{1}{2}$
Bodies inspected .	–	3	–	–	1	–	1	–	–	1	–	17	3	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–		–	–	–	–
																														Total		513	58	571	

TABLE, N° 2,

Showing the Months in which the Casualties occurred.

1818. Period.	Class.	Endemic Fever.	Feb. Cont. Commun.	Abscess.	Pneumonia.	Gastritis.	Enteritis.	Hepatitis.	Abscess of the Liver.	Phthisis Pulmon.	Phthisis Pulmon. combined with Abscess of the Liver.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria combined with Softness of the Liver.	Dysenteria with an Enlargement and softened Structure of the Liver.	Dysenteria with morbid Structure of the Liver.	Dysenteria combined with Abscess of the Liver and Hydrothorax.	Tetanus.	Apoplexia.	Epilepsia.	Asthma.	Hydrothorax combined with Abscess of the Liver.	Anasarca.	Ascites.	Syphilis Consecutiva.	Vul. Sclop.	Vul. Sagittar.	Ulcus.	Accidents.	Found Dead.	Drowned.	Suicide.	Total Deaths by Disease.	Killed in the Field.	Grand Total.
From 1st to 31st of January	European	4	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	8	3	11
	Malay	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	3
	Caffrie	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Indian	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	2	3
From 1st to 28th of February	European	5	.	.	.	.	.	2	2	1	1	4	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	18	4	22
	Malay	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	2	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	3	2	5
	Indian	.	.	.	1	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	1	4
From 1st to 31st of March	European	9	.	.	.	.	.	.	1	.	.	4	2	.	.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	1	.	.	20	4	24
	Malay	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	3	5	8
	Caffrie	.	.	.	.	.	.	.	1	2	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	6	2	8
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	7	8
From 1st to 30th of April	European	11	.	.	.	.	.	1	.	.	.	8	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	1	.	.	.	25	5	30
	Malay	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	6	7	13
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Indian	2	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	6
From 1st to 31st of May	European	18	.	.	.	.	.	.	.	.	.	10	5	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	36	3	39
	Malay	6	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	1	8
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	4	.	4
From 1st to 20th of June	European	6	.	.	.	.	.	.	.	.	.	13	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	21	3	24
	Malay	3	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.	6
	Caffrie	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Indian	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
From 21st of June to 20th of July	European	15	.	.	.	.	1	.	.	.	.	7	3	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	28	.	28
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1
	Indian	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	3	.	.	6	.	6
From 21st of July to 29th of August	European	38	.	.	1	.	.	1	.	.	.	15	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	57	.	57
	Malay	8	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10	1	11
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	.	.	.	.	.	.	6	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	7
From 21st of August to 20th of September	European	46	.	.	.	.	.	2	.	.	.	3	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	53	.	53
	Malay	2	.	.	.	.	.	.	.	.	.	4	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	7	.	7
	Caffrie	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Indian	1	.	.	.	1	.	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	7	.	7
From 21st of September to 20th of October	European	41	.	.	.	.	.	.	.	.	.	6	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	49	.	49
	Malay	2	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	4
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	5	.	5
From 21st of October to 20th of November	European	44	.	.	.	.	.	1	.	.	.	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	51	.	51
	Malay	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	3
	Caffrie	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	5	.	5
	Indian	1	.	.	.	.	.	.	.	.	.	3	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	6	.	6
From 21st of November to 20th of December	European	17	.	1	.	1	.	.	1	.	.	6	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	27	.	27
	Malay	1	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1
	Indian	1	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	4	.	4
																															Total	513	58	571

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Abstract of the Monthly Returns of the European Sick, admitted into Hospital, Kandy, from the 21st December 1817, to 20th December 1818.

| | Diseases. | | |

Abstract of the Monthly Returns of the European Sick admitted into Hospital, Badula, from the 21st December 1817, to 20th December 1818.

| | Diseases. | | |

1819.

The Kandyans having submitted to the Colonial Government towards the end of the last annual period, the troops were during this year exposed to no unusual fatigue, nor liable to many privations. Notwithstanding the cessation of active hostilities, it was still deemed necessary to garrison a great number of posts: the troops were therefore much detached, a circumstance unfavourable to health in this country. The distance of many of the small posts from an hospital station, together with the rugged and impracticable qualities of the pathways, contributed to prevent a speedy transfer of sick to the care of a medical officer. In a climate of this kind, where diseases run such a rapid course, and are so frequently fatal, any circumstance which retards the application of medical means, after the supervention of disease, is a serious evil, frequently an irreparable one.

There being little interchange of troops during the present year, a better opportunity was afforded of ascertaining the comparative insalubrity of particular posts than could be obtained in the preceding annual period.

The troops in the post of Nalandy became suddenly very unhealthy, about the 10th or 11th of January. There were 34 Europeans on duty at this post, 21 of whom were attacked with fever in the course of twenty-four hours; 14 of the whole number died. The European part of the garrison was withdrawn about the end of the month of January. Nalandy is about thirty-two miles distant from Kandy. It is situated upon the slope of the declivity of the interior terrace that faces towards Trincomale.

Epidemic cholera appeared among the troops in Kandy about the end of February. During the months of March and April this inscrutable disease visited a majority of the posts in the interior. The prevalence of cholera abated towards the end of May. The last case of the disease admitted into the hospital at Kandy was on the 12th of June. The

mortality occasioned by cholera will appear by the subsequent returns.

About the middle of March, fever began to prevail among the two classes of troops, namely, Europeans and Indians, stationed at Fort King. Eventually the attack of fever became almost universal. Not a European belonging to the garrison escaped. I am aware of only two Europeans that resided for a short time at Fort King, during the prevalence of the endemic, who escaped an attack of fever. Among the Indians, only about 3 or 4 per cent. were exempted from it. The endemic did not spread less generally among the indigenous inhabitants in the bazar of Fort King. It was, however, much more fatal among them than among the Indians in the employ of Government. The bazar was estimated to contain about 700 people, including all ages. Of this number from 110 to 120 died, or about one sixth of the whole inhabitants. The endemic was very limited in extent. It was strongly felt among the Kandyans to about three miles around the fort; but beyond that circle its influence was much less severe. Health prevailed at the distance of about six miles. The influence of the cause of fever did not subside to any considerable degree until towards the end of June.

The very great prevalence of fever during the above months at Fort King, has hitherto been considered unaccountable. Until the present period, this post had been remarkable for salubrity. It may likewise be mentioned, that the European part of the garrison was chiefly composed of men of the 59th regiment; and, as this corps did not reach Ceylon from Bengal until after the termination of the insurrection, the men had not undergone the fatiguing duties of that service. During the months of March and April, much rain fell. The fever therefore commenced while the weather was rainy and the atmosphere moist. The Indians were chiefly employed as pioneers in constructing the ramparts of the fort: they were therefore exposed to the rays of an ardent sun, but not in an unusual degree.

The small post of Taldinea became very unhealthy (particularly to Europeans) about the end of April. This post is situated in the province of Doombara, and is about ten miles from Kandy. The European part of the garrison consisted of 33 individuals. Of this number 32 were attacked with fever, which was chiefly of a remittent type.

Another proof of the insalubrity of the Vellasse flats, during some seasons, occurred this year. The garrison of Badula was reinforced by a detachment of 64 men of the 73d regiment, from Trincomale. This detachment marched through Vellasse early in May, and reached Badula on the 12th of that month. Between the 21st of May and the 20th of June, 40 of these men were attacked with fever, and 5 with dysentery. Six died of the former disease, and two of the latter.

Annexed are Tables of the casualties which occurred among the troops this year (exclusively of the Honourable Company's native troops employed in Ceylon), similar to those given of former annual periods. I have likewise added an abstract of the monthly returns of European sick admitted into the hospitals of Kandy and Badula, from the 21st December 1818 to 20th December 1819.

TABLE, No 2,

Showing the Months in which the Casualties occurred.

Period.	Class.	Diseases, or Cause of Death.																									Total Deaths by Disease.
		Endemic Fever.	Abscess.	Phrenitis.	Pneumonia.	Carditis.	Enteritis.	Hepatitis.	Abscess of the Liver.	Variola.	Phthisis Pulmon.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria with Induration of the Liver.	Asthma.	Apoplexia.	Paralysis.	Colica.	Cholera Epidemica.	Atrophia.	Anasarca.	Hydrothorax.	Ulcus Grav.	Various.	
From 21st December 1818, to 20th January 1819.	European	17	.	1	.	.	.	.	.	.	.	9	.	.	.	.	.	.	.	.	.	.	.	1	28
	Malay	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
	Caffrie	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Indian	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
From 21st January to 20th February.	European	7	.	.	.	.	.	.	.	.	.	1	1	1	.	.	.	.	.	.	.	.	1	.	11
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.
	Caffrie	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	1
From 21st February to 20th March.	European	2	.	.	.	.	.	1	.	.	.	4	.	.	.	.	.	.	1	.	.	.	.	.	8
	Malay	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	3
	Caffrie	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	2	.	.	.	.	.	3
	Indian	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	3
From 21st March to 20th April.	European	3	1	.	.	.	.	.	.	.	.	6	.	.	.	.	.	.	14	.	.	.	1	1	26
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	9	.	.	.	.	.	10
	Caffrie	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	.	.	13	.	.	.	.	.	15
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11	1	.	.	.	.	12
From 21st April to 20th May.	European	7	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	3	.	1	1	.	1	15
	Malay	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	2	.	.	.	.	.	4
	Caffrie	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	12	.	.	.	.	.	14
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6	.	.	.	.	.	6
From 21st May to 20th June.	European	26	.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	3	.	.	.	.	.	31
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	2
	Indian	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	3
From 21st June to 20th July.	European	4	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	1	7
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	2
	Caffrie	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	3
	Indian	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
From 21st July to 20th August.	European	3	.	.	.	.	.	.	.	.	.	1	3	.	.	.	.	.	.	.	.	.	.	.	7
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Caffrie	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	2
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
From 21st August to 20th September.	European	3	.	.	.	.	.	.	.	.	.	4	2	.	.	.	.	.	.	.	.	.	.	.	9
	Malay	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1
	Caffrie	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Indian	.	.	.	.	1	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	3
From 21st September to 20th October.	European	1	.	.	.	.	.	.	.	.	.	2	.	.	1	.	.	.	.	.	.	.	.	.	4
	Malay	2	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	2	.	.	.	.	.	6
	Caffrie	.	.	.	.	.	.	.	1	.	1	.	.	.	1	.	.	.	.	.	.	.	.	.	3
	Indian	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
From 21st October to 20th November.	European	1	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	3
	Malay	1	.	.	1	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	4
	Caffrie	.	.	.	.	.	.	.	5	.	1	.	.	.	.	1	.	.	.	.	.	.	.	1	8
	Indian	1	.	.	.	.	.	.	7	1	.	.	.	.	.	.	2	.	.	1	.	.	.	.	12
From 21st November to 20th December 1819.	European	1	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
	Malay	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	1	.	.	1	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
	Indian	.	.	.	.	.	.	.	9	.	2	.	.	.	.	.	.	.	.	.	.	.	1	1	13
																								Total	310

BIBLIOTHECA REGIA MEDICO-CHIRURGICA

Abstract of the Monthly Returns of the European Sick, treated in Hospital of Kandy, from 21st *December* 1818, *to* 20th *December* 1819.

| | Diseases. | | |

TABLE, N° 1,

Showing the Strength, Casualties, &c. of the Troops, from 21*st December* 1818, *to* 20*th December* 1819.

1819.	Average Strength.	Diseases, or Causes of Death.																						Total Deaths.	Proportion of Deaths per Cent. to the whole Number.
		Endemic Fever.	Abscess.	Phrenitis.	Pneumonia.	Carditis.	Enteritis.	Hepatitis.	Abscess of the Liver.	Variola.	Phthisis Pulmon.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria, with Induration of the Liver.	Asthma.	Apoplexia.	Paralysis.	Colica.	Cholera Epidemica.	Atrophia.	Anasarca.	Hydrothorax.	Ulcus Grav.	Various.		
Europeans	847	75	1	1	—	—	—	1	1	1	—	30	9	1	—	2	—	—	21	—	2	1	2	4[a]	152	17¾
Number of Bodies inspected	—	61	1	1	—	—	—	—	1	—	—	30	9	1	—	1	—	—	16	—	1	1	—	1	—	—
Malays	660	8	—	—	1	—	1	—	—	1	1	6	—	—	1	—	—	—	16	1	1	—	—	—	37	5⅝
Number of Bodies inspected	—	1	—	—	1	—	1	—	—	—	—	3	—	—	1	—	—	—	10	—	—	—	—	—	—	—
Caffries	474	1	—	—	4	—	—	1	1	14	4	5	—	—	—	1	1	—	29	—	2	—	—	1[b]	64	13½
Number of Bodies inspected	—	—	—	—	4	—	—	1	1	2	3	5	—	—	—	—	1	—	26	—	—	—	—	—	—	—
Indians	508	4	—	—	1	1	—	—	—	18	1	5	—	—	—	—	—	2	20	1	2	—	1	1[c]	57	11⅕
Number of Bodies inspected	—	2	—	—	1	1	—	—	—	—	1	2	—	—	—	—	—	2	7	1	1	—	—	—	—	—
																							Total		310	

[a] 1 Found dead—3 drowned. [b] Unknown. [c] Found dead.

Abstract of the Monthly Returns of the European Sick, treated in Hospital, Badula, from the 21*st December* 1818, *to* 20*th December* 1819.

	Diseases.																																				
	Feb. Quot. Intermit.	Tertian.	Quartan.	Remittens.	Abscess.	Cynanche Tonsil.	Pneumonia.	Enteritis.	Hepatitis Acut.	Hepatitis Chron.	Rheumatism. Acut.	Rheumatism. Chron.	Variola.	Catarrhus Acut.	Dysenteria Acut.	Dysenteria Chron.	Paralysis.	Epilepsia.	Colica.	Asthma Conv.	Cholera Morb.	Anasarca.	Syphilis Primit.	Bubo Simplex.	Icterus.	Gonorrhœa.	Hernia Humor.	Opstipatio.	Subluxatio.	Vulnus Incis.	Ulcus.	Fractura.	Amputatio.	Pruritus.	Psora.	Total.
Remained 20th December 1818	17	5	.	17	.	.	1	.	.	.	.	.	.	.	4	2	.	.	.	.	.	1	.	.	.	.	.	.	.	.	2	.	.	.	.	49
Admitted since ...	55	8	1	17	1	2	1	3	9	3	2	.	1	4	65	20	1	1	2	1	18	6	5	2	1	22	6	1	1	1	27	1	1	1	1	351
Total treated	72	13	1	94	1	2	2	3	9	3	2	.	1	4	69	22	1	1	2	1	18	7	5	2	1	22	6	1	1	1	29	1	1	1	1	400
Discharged	71	13	1	81	1	1	2	3	7	1	2	.	1	4	55	12	1	1	2	1	9	6	5	2	1	22	6	1	1	1	27	1	1	1	1	345
Died	.	.	.	13	.	.	.	.	2	2	.	.	.	.	14	8	.	.	.	.	9	1	.	.	.	.	.	.	.	.	1	.	.	.	.	50
Remaining 20th December 1819	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	5
Proportion of Deaths to the Number treated	.	.	.	1 to $7\frac{3}{10}$	.	.	.	.	1 to $4\frac{1}{2}$	1 to $1\frac{1}{2}$	.	.	.	.	1 to $4\frac{13}{14}$	1 to $2\frac{6}{8}$	.	.	.	.	1 to 2	1 to 7	.	.	.	.	.	.	.	.	.	1 to 29	.	.	.	.	1 to 8

1820.

During the early months of this period, the European detachments in the Kandyan provinces were withdrawn to the coast, and relieved chiefly by the 45th regiment. This was a very desirable measure, as few of the men of the detachments had, during their service in the interior, escaped an attack of fever or dysentery.

The most part of the European troops employed in the Kandyan provinces during the present period belonged, therefore, to the 45th regiment. When this fine corps reached Kandy, it had been about nine months in the island. On that account the men were, in some degree, assimilated to a warm climate. Previously to the embarkation of the regiment for Ceylon, all the disabled and sickly men were discharged. The corps was composed of men whose ages averaged about twenty-six years. Very few of them had suffered from disease either in this country or in Europe. In addition to these circumstances, so favourable to health, the corps was under correct discipline. The officer in command of the corps paid much attention to the messing and other sources of health and comfort of the men.

The small detachments were but few, by which means the sick were generally soon conveyed to hospital. Hence a number of propitious circumstances combined to render this corps healthy.

Until the month of May this year, the retail of arrack in the greater part of the Kandyan country was prohibited. Contraband arrack had been occasionally imported from the maritime provinces; but, on account of the risk attending this unlawful trade, the price of spirits was always comparatively high, and the supply not regular. Intemperance among the troops was, therefore, only casual, and seldom excessive. Subsequently, however, to the legal retail of spirits, inebriety became much more common than it had been; and from that pe-

riod the proportion of sick increased, particularly in the garrison of Kandy.

None of the stations have been remarkable for insalubrity during this period. In the months of September and October a few severe cases of remittent fever appeared at Badula: only one, however, proved fatal. The post of Ratnapore has been very healthy during this year. Below I have contrasted the returns of sick from Badula and the latter station.

	Badula.	Ratnapore.
Mean Strength	95	84
Proportion of Sick per Cent.....	10.5	2.6
Mortality per Cent.	6.2	1.1

The salubrity of Ratnapore has been uninterrupted since the country was occupied by a British force. This is the more remarkable, as the climate of the neighbourhood of the post appears to possess, in no small degree, many of the circumstances to which fever is ascribed. Being situated immediately below the upland terrace, the high hills which rise behind the position exclude the influence of the north-east monsoon. Except upon the protuberances of the surface, which are covered with jungle, the soil is alluvial, and in many places marshy. The site of the post is not much above the level of the sea. Ratnapore is therefore liable to a high degree of reflected heat, defective ventilation, and to the exhalations which arise from gentle eminences over-run with low brush-wood, interspersed with alluvial soil and marshy patches of low ground. Badula is situated about 1900 feet higher above the level of the sea than Ratnapore.

An unusual proportion of cases of diarrhœa appear in the return of the hospital of Kandy. This circumstance seemed to be occasioned by the introduction of a number of troops from the maritime provinces, principally from Colombo. It is generally observed that troops, on their arrival at any of the posts situated on the elevated terrace, are liable to be attacked

with slight bowel complaints. Perhaps this circumstance is to be attributed to the reduced temperature of the upper country. The cases of diarrhœa were chiefly confined to the 45th regiment. The number of cases of anasarca which appear on the annual return of European sick admitted into the hospital of Kandy is greater than in any preceding annual period. The disease was chiefly confined to about ten or twelve individuals belonging to the 45th regiment. The repeated relapse of some of the cases increased the number of admissions to thirty-four. In general, the men who suffered by this disease were much addicted to the immoderate use of spirits. For the most part, the swelling was confined to the lower extremities. In two or three instances the dropsical symptoms extended to the abdomen and thorax. Perhaps a great proportion of these cases ought to have been returned under the head "Beriberi."

The casualty returns of the Malays and Caffries give but little occasion for remark.

Towards the middle of July, a considerable number of ill-conditioned ulcers appeared among the pioneers on duty in the interior. This disease was remarkably prevalent among the detachments employed upon the roads in the neighbourhood of Kandy. The exciting causes were chiefly leech-bites and slight injuries of the skin of the lower extremities. The sloughing condition of ulcers among Indians has hitherto appeared to be intimately connected with much exposure to variable weather, together with hard labour, when compared to the feeble constitutions of these people, and their moderately nutritious diet. Particular seasons or states of weather seem likewise to have some influence. Although the pioneers were employed on the roads from the month of February, ill-conditioned ulcers did not appear among them until July. During the months of August, September, and October, almost every slight wound became an ill-conditioned ulcer. In many cases the ulcers were in a sloughing state on admission into hospital. During the months of November and December the bad ulcers

improved much, and from about that period the leech-bites and inconsiderable wounds did not deteriorate as formerly.

I have subjoined Tables of the casualties which occurred among the troops (exclusively of the Hon. Company's native troops) employed in the interior during this year, together with an abstract of the monthly returns of European sick admitted into the hospitals of Kandy and Badula; as also returns of the Malays and Indians treated in the hospital of Kandy.

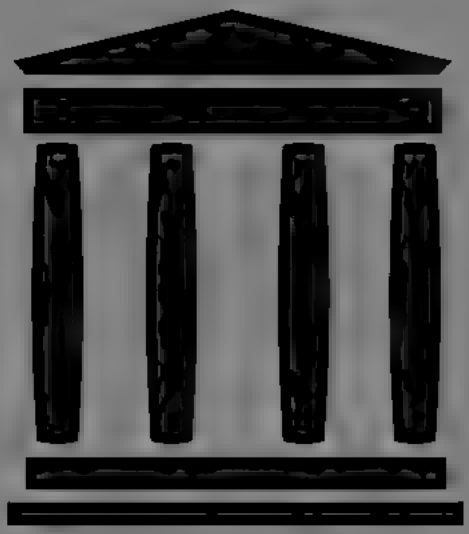
TABLE, N° 1,

Showing the Strength, Casualties, &c. of the Troops, from the 21st December 1819, to the 20th December 1820, in the Interior.

1820.	Average Strength.	Diseases, or Causes of Death.																											Total of Deaths.	Proportion of Deaths per Cent. of the whole Number.
		Endemic Fever.	Pneumonia.	Gastritis.	Enteritis.	Abscess of the Liver.	Rheumatism. Chron.	Variola.	Erysipelas.	Hæmorrhage.	Phthisis Pulmon.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria combined with Induration of the Liver.	Dysenteria combined with morbid Softness of Liver.	Intoxicatio.	Cholera Epidemica.	Atrophia.	Anasarca.	Hydrothorax.	Contusio.	Ulcer in the Trachea.	Ulcus Grave.	Drowned.	Unknown.	Accidents.	Executed.	Suicide.	Found Dead.		
Europeans	806	4	.	.	.	.	1	.	.	.	2	15	8	.	2	1	2	.	1	1	.	.	.	5	.	3[a]	.	1	.	46	5.7
Number of Bodies inspected	.	3	.	.	.	.	1	.	.	.	1	12	8	.	2	1	1	.	1	1	.	.	.	.	.	1	.	.	.	.	.
Malays	1153	3	5	1	2	.	.	.	.	1	5	9	1	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	2	31	2.6
Number of Bodies inspected	.	1	1	1	1	.	.	.	.	1	5	6	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.
Caffries	330	.	1	.	.	2	.	3	.	.	2	4	1	.	.	.	.	1	.	1	1	.	.	.	3	.	3	.	.	22	6.6
Number of Bodies inspected	.	.	1	.	.	2	.	1	.	.	1	3	1	.	.	.	.	1	.	1	1	.	.	.	.	.	.	.	.	.	.
Indians	956	2	.	.	.	2	.	5	1	.	.	20	1	2	.	.	2	.	.	.	1	.	1	.	2	1[b]	.	.	.	40	4.1
Number of Bodies inspected	.	1	.	.	.	2	.	.	1	.	.	14	1	2	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	2	.
																										Total				139	

[a] Two were killed by the explosion of a rock—one by the fall of a tree.

[b] Killed by an elephant.



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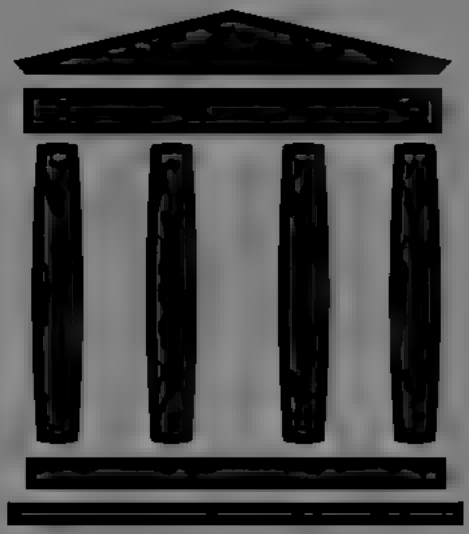

Placeholder

Abstract of the Monthly Returns of the European Sick admitted into Hospital, Badula, from 21*st December* 1819, *to* 20*th December* 1820.

	Feb. Quotidian. Intermittens.	Tertian.	Remittens.	Ophthalmia Acut.	Cynanche Tonsil.	Pneumonia.	Enteritis.	Hepatitis Acut.	Hepatitis Chron.	Splenitis.	Rheumatism. Acut.	Hæmorrhois.	Catarrhus Acut.	Dysenteria Acut.	Dysenteria Chron.	Colica.	Cholera Epidemica.	Diarrhœa.	Anasarca.	Ulcera Penis, n. Syphilitic.	Bubo Simplex.	Gonorrhœa.	Hernia Humor.	Strictura Urethræ.	Subluxatio.	Vulnus Capitis.	Ulcus.	Fractura.	Pruritus.	Total.
Remained 20th December 1819	1	.	.	.	1	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	1	.	.	5
Admitted during the above Period	18	1	13	2	2	1	1	6	2	2	8	1	6	16	4	3	2	12	1	11	8	23	7	1	1	2	26	1	4	185
Total treated	19	1	13	2	3	1	1	6	2	2	8	1	6	16	6	3	2	12	1	11	8	23	7	1	1	2	27	1	4	190
Discharged during the above Period	19	1	5	2	3	1	1	4	2	2	8	1	6	15	2	3	2	12	1	11	8	23	7	.	1	2	27	1	4	174
Died ditto	.	.	1	.	.	.	.	.	.	.	.	.	.	1	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Remaining 20th December 1820	.	.	7	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	10
Proportion of Deaths to the Number treated	.	.	1 to 13	.	.	.	.	.	.	.	.	.	.	1 to 16	1 to $1\frac{2}{4}$	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1 to $31\frac{4}{6}$

Mean Strength 95; Sick per Cent. 10.5; Rate of Mortality 6.2.

TABLE, No 2,

Showing the Months in which the Casualties occurred.

Period.	Class.	Endemic Fever.	Pneumonia.	Enteritis.	Gastritis.	Abscess of the Liver.	Rheumatism, Chron.	Variola.	Erysipelas.	Hæmorrhage.	Phthisis Pulmon.	Dysenteria.	Dysenteria combined with Abscess of the Liver.	Dysenteria combined with Induration of the Liver.	Dysenteria with morbid Softness of the Liver.	Intoxicatio.	Cholera Epidemica.	Atrophia.	Anasarca.	Hydrothorax.	Contusio.	Ulcer in the Trachea.	Ulcus Grave.	Drowned.	Unknown.	Accidents.	Executed.	Suicide.	Found Dead.	Total Deaths by Disease.
From 21st December 1819, to 20th January 1820.	European	.	.	.	.	.	.	.	.	.	.	2	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	4
	Malay	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	1	.	5	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
From 21st January to 20th February.	European	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Malay	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Caffrie	.	1	.	.	.	.	1	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	5
	Indian	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
From 21st February to 20th March.	European	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	2
	Malay	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	.	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	3
	Indian	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
From 21st March to 20th April.	European	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	2
	Malay	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3
	Caffrie	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Indian	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
From 21st April to 20th May.	European	.	.	.	.	.	.	.	.	.	1	2	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	5
	Malay	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	.	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3	.	.	.	5
	Indian	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
From 21st May to 20th June.	European	1	.	.	.	.	.	.	.	.	3	3	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	9
	Malay	1	1	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	5
	Caffrie	.	.	.	1	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Indian	.	.	.	.	.	.	.	.	.	1	.	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	4
From 21st June to 20th July.	European	.	.	.	.	1	.	.	.	.	.	1	.	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	4
	Malay	1	2	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	5
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	.	.	1	.	.	2	1	.	.	.	1	.	.	.	.	.	.	.	1	1	.	.	.	7
From 21st July to 20th August.	European	1	.	.	.	.	.	.	.	1	2	.	.	1	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	6
	Malay	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Caffrie	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
	Indian	.	.	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
From 21st August to 20th September.	European	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	3
	Malay	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	3
From 21st September to 20th October.	European	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	2
	Malay	1	1	.	.	.	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	.	.	.	.	.	.	.	.	.	.	2
	Indian	1	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	3
From 21st October to 20th November.	European	.	.	.	.	.	.	.	.	1	2	.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	.	.	5
	Malay	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	3
	Indian	1	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	4
From 21st November to 20th December 1820.	European	2	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	3
	Malay	.	.	1	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
	Caffrie	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Indian	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2
																												Total	189

Abstract of the Monthly Returns of the European Sick admitted into Hospital, Kandy, from 21st *December* 1819, *to* 20*th December* 1820.

	Feb. Quot. Intermit.	Tertiana.	Remittens.	Continua Communis.	Phlegmon et Abscessus.	Ophthalmia s. m. Acut.	Cynanche Tonsillaris.	Pneumonia.	Hepatitis Acuta.	Hepatitis Chronica.	Rheumatism. Acutus.	Rheumatism. Chronicus.	Erysipelas.	Phthisis Pulmonalis.	Hæmorrhois.	Catarrhus Acutus.	Catarrhus Chronicus.	Dysenteria Acuta.	Dysenteria Chronica.	Apoplexia.	Cephalalgia.	Intoxicatio.	Dyspepsia.	Colica.	Cholera Morbus.	Diarrhœa.	Anasarca.	Beriberi.	Scrofula.	Syphilis Primit.	Ulcera Penis n. Syphil.	Bubo Simplex.	Gonorrhœa.	Hernia Humoralis.	Strictura Urethræ.	Aneurisma.	Procidentia Ani.	Subluxatio.	Vulnus.	Contusio.	Ambustio.	Ulcus.	Ulcus Grav.	Fractura Clavículæ.	Amputatio.	Punitus.	Psora.	Total.
Remained 20th December 1819 . .	1	1	.	3	.	.	.	.	.	1	.	2	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	.	.	.	1	.	1	.	.	.	.	14
Admitted during the above Period	2	7	3	105	7	6	1	14	9	3	13	3	1	1	2	5	1	79	4	1	.	1	1	4	2	54	34	1	1	6	13	34	9	4	1	1	1	6	6	4	7	100	4	1	1	17	5	585
Total treated	3	8	3	108	7	6	1	14	9	4	13	5	1	1	2	5	1	80	4	1	1	1	1	4	2	54	34	2	1	6	14	34	9	4	1	1	1	6	6	5	7	101	4	1	1	17	5	599
Discharged during the above Period	3	8	2	103	7	6	.	14	5	3	10	4	1	.	2	5	1	60	4	1	1	.	1	4	.	54	29	2	1	6	12	22	9	4	1	1	1	5	6	5	5	95	4	1	1	17	5	531
Died ditto	.	.	.	1	.	.	.	.	3	.	.	.	.	1	.	.	.	11	.	.	.	1	.	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	20
Remaining 20th December 1820 . .	.	.	1	4	.	.	1	.	1	1	3	1	.	.	.	.	.	9	.	.	.	.	.	.	.	.	4	.	.	.	2	12	.	.	.	.	.	1	.	.	2	6	.	.	.	.	.	48
Proportion of Deaths to the Number treated	.	.	.	1 to 108	.	.	.	.	1 to 3	.	.	.	.	1 to 1	.	.	.	1 to $7\frac{3}{11}$	.	.	.	1 to 1	.	.	1 to 1	.	1 to 34	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1 to $29\frac{19}{20}$

Mean Strength 394. Proportion of Sick in Hospital varied from 3 to 10 per cent. The average throughout the year was 6.6.

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Abstract of the Monthly Sick Returns of the 1st *Ceylon Regiment (Malays), admitted into Hospital, Kandy, from* 21st *December* 1819, *to* 20th *December* 1820.

	Feb. Quot. Intermit.	Tertiana.	Remittens.	Continua Communis.	Ephemera.	Phlegmon et Abscessus.	Ophthalmia s. m. Acut.	Ophthalmia s. m. Chron.	Nyctalopia.	Cynanche Tonsillaris.	Pneumonia.	Hepatitis Chronica.	Enteritis.	Otitis.	Rheumatism. Chronicus.	Varicella.	Phthisis Pulmonalis.	Catarrhus Acutus.	Dysenteria.	Paralysis.	Dyspepsia.	Asthma.	Colica.	Cholera Morbus.	Diarrhœa.	Atrophia.	Anasarca.	Scrofula.	Ulcera Penis n. Syphil.	Bubo Simplex.	Gonorrhœa.	Hernia Humoralis.	Hernia Strangulata.	Subluxatio.	Vulnus.	Contusio.	Ambustio.	Ulcus.	Punitus.	Scabies.	Herpes.	Morbi Cutis.	Total.
Remained 20th December 1819 . .	.	1	.	1	.	.	.	1	.	.	2	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	3	.	.	13
Admitted during the above Period	11	41	2	39	159	45	3	5	1	1	28	1	5	1	32	8	4	9	17	2	1	1	24	2	35	1	4	3	7	16	3	7	1	7	6	22	2	79	49	127	1	1	813
Total treated	11	42	2	40	159	45	3	6	1	1	30	1	5	1	32	10	4	9	17	2	1	1	24	2	35	1	4	3	7	16	3	7	1	7	6	22	2	81	50	130	1	1	826
Discharged during the above Period	9	36	1	36	158	44	3	6	1	1	25	1	3	1	31	9	3	9	10	2	1	1	24	2	34	1	3	3	7	16	3	7	1	7	6	20	1	76	49	125	1	1	778
Died ditto	1	.	.	1	.	.	.	.	.	.	4	.	2	.	.	.	1	.	6	.	.	.	.	.	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	17
Remaining 20th December 1820 . .	1	6	1	3	1	1	.	.	.	.	1	.	.	.	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	5	1	5	.	.	31
Proportion of Deaths to the Number treated	1 to 11	1	.	1 to 40	.	.	.	.	.	.	1 to $7\frac{2}{4}$	.	1 to $2\frac{1}{2}$	.	.	.	1 to 4	.	1 to $2\frac{5}{6}$	.	.	.	.	.	1 to 35	.	1 to 4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1 to $48\frac{10}{17}$

Mean Strength 577. Sick per Cent. 4.1. Rate of Mortality per Cent. 3.

Abstract of the Monthly Returns of Sick of the Class Indians, which includes the Pioneer Corps and a Detachment of Gun Lascars, admitted into Hospital, Kandy, from the 21st December 1819, to the 20th December 1820.

	Feb. Quot. Intermit.	Tertiana.	Cont. Com.	Phlegmon et Abscessus.	Ophthalmia, S. M. Acut.	Pneumonia.	Hepatitis Acut.	Rheumatism. Acut.	Rheumatism. Chron.	Variola.	Varicella.	Erysipelas.	Catarrhus Acut.	Dysenteria.	Paralysis.	Colica.	Cholera Morbus.	Diarrhœa.	Atrophia.	Anasarca.	Scrofula.	Ulcera Penis non Syphil.	Ulcera Penis et Bubo.	Bubo Simplex.	Icterus.	Gonorrhœa.	Hernia Humor.	Obstipatio.	Subluxatio.	Vulnus Incisum.	Contusio.	Ambustio.	Ulcus.	Ulcus Grave.	Fractura Femor.	Pruritus.	Psora.	Morbi Cutis.	Total.
Remained 20th December 1819	4	2	1	2	.	.	.	.	3	7	.	.	1	2	.	.	.	.	.	.	.	2	.	2	.	.	1	.	.	.	.	.	5	.	.	.	.	.	32
Admitted during the above Period	115	25	41	15	2	4	5	54	.	9	2	1	11	42	1	4	4	43	2	2	1	20	8	26	1	6	3	1	1	8	24	5	212	18	1	8	25	3	753
Total treated	119	27	42	17	2	4	5	54	3	16	2	1	12	44	1	4	4	43	2	2	1	22	8	28	1	6	4	1	1	8	24	5	217	18	1	8	25	3	785
Dischargedduring the above Period	115	27	38	17	2	4	5	54	3	12	2	.	12	38	1	4	2	41	1	2	1	21	8	27	1	6	4	1	1	8	24	5	199	13	.	8	25	2	724
Died ditto.....	1	.	1	.	.	.	.	.	.	4	.	1	.	16	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	26
Remaining 20th December 1820	3	.	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	2	1	.	.	1	.	1	.	.	.	.	.	.	.	.	18	4	1	.	.	1	35
Proportion of Deaths to the Number treated	1 to 119	.	1 to 42	.	.	.	.	.	.	1 to 4	.	1 to 1	.	1 to $2\frac{12}{16}$	.	.	1 to 2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1 to 18	.	.	.	.	1 to $30\frac{15}{26}$

Mean Strength 535; Sick per Cent. 7; Rate of Mortality per Cent. 4.8.

CHAPTER III.

Observations on the Prevalence and Fatality of particular Diseases; and on the comparative Rate of Mortality among European Troops employed to the Eastward of the Cape of Good Hope and those in Great Britain, &c.

In regard to Europeans, the hospital returns of Kandy and Badula will show that the prevailing diseases among that class of troops are fever, diseases of the liver, and dysentery. Under particular circumstances, they are liable to ill-conditioned ulceration of the lower extremities. The admissions on account of other diseases are not numerous, and in general they are unimportant. Having an endemic origin, little can be done to prevent the frequency of the above-mentioned diseases, except by avoiding the exciting causes. The influence of the exciting causes is, however, often very powerful in occasioning disease. Health seems often to be, in a great degree, enjoyed in proportion as their hurtful tendency is avoided. It cannot be doubted that the remote causes of several important and dangerous diseases occasionally exist in abundance in many tropical countries. But it must likewise be admitted that Europeans are, in hot climates, comparatively exempt from many sources of human misery and disease, to which they are liable in their native country. They are either completely exempted from the following diseases, or very little incident to them: contagious fever, consumption, the diseases belonging to the order Vesaniæ, scrofula, stone in the bladder, and cancer. Moral as well as physical phenomena may contribute to the comparative immunity of troops from some of these diseases. The abstracts from the monthly returns of the different classes of troops exhibit an accurate view of the de-

grees of prevalence of different diseases among the troops for the period specified, on this account, that every man unfit for duty is received into hospital.

The proportionate mortality of different diseases among the Europeans treated in the hospitals of Kandy and Badula appears on the returns. Few casualties occurred in either of these hospitals except from fever, diseases of the liver, or dysentery. The rates of mortality to the number treated may be briefly stated thus:

		Kandy.	Badula.
1818.	Remittent Fever	1 to 8.4	1 to 3.2
	Hepatitis (acute and chronic)	1 to 5	1 to 8
	Dysentery (acute and chronic)	1 to 3.7	1 to 3.8
1819.	Remittent Fever	1 to 7	1 to 7.2
	Hepatitis (acute and chronic)	—	1 to 3.2
	Dysentery (acute and chronic)	1 to 4	1 to 3.1
1820.	Remittent Fever	—	1 to 13
	Hepatitis (acute and chronic)	1 to 4.3	———
	Dysentery (acute and chronic)	1 to 7.6	1 to 4.4

In the above statement there appears a remarkable difference between the proportionate mortality from fever in the hospitals of Kandy and Badula during the year 1818. I can, however, afford no satisfactory explanation of the cause of this difference.

The preceding abstract of the monthly returns of sick of the 1st Ceylon regiment admitted into the hospital at Kandy during the year 1820, will show the diseases to which Malays are chiefly liable. The frequency of inflammatory affections of the chest among this people, when compared with Europeans, is very remarkable. Dysentery, although less frequent among Malays than among Europeans, seems to be fully as little under the influence of curative means in the former class as in the latter. Malays are much liable to emaciation and weakness, without hectic fever. Enlargements of the mesenteric glands appear to be the cause of this species of

atrophy. The cervical glands sometimes become enlarged in this class of people.

Caffries, as appears by the casualty returns, are in a remarkable degree exempted from the fatal effects of endemic fever. They are much liable to affections of the chest, particularly to consumption. Traces of inflammation of the viscera of the thorax are found in the body of almost every Caffrie that is inspected. Sometimes the marks of inflammation appear to be recent; at other times they seem to be very remote.

The Indians (as will appear by the preceding abstract of the returns of the sick of this class admitted into the hospital of Kandy during the year 1820) are, comparatively, very liable to intermittent fevers. Dysentery is, however, the chief source of mortality among them. Under fatigue and exposure to variable weather they are very obnoxious to sloughing ulcers of the lower extremities.

Comparative statements of the mortality of troops serving in different countries would be extremely interesting to the intelligent part of society, and particularly to those who concern themselves with the natural history of man. To obtain accurate and comprehensive documents of this kind would require the concurrent and active exertions of assiduous inquirers in different quarters of the world. Many practical advantages might result from investigations of this nature, if extensively conducted.

What proportion does the mean ratio of mortality among European troops in India, under all circumstances of service, bear to the mortality of similar classes of individuals in Europe? This is a difficult problem to solve: before it can be answered satisfactorily, much investigation will require to be instituted.

The following data regarding the mortality of certain classes of people, chiefly in Europe, are well founded:

The mortality of the troops in Gibraltar during the years of ordinary health is..... 1 in 48.4

Vide Med. Chirur. Trans. vol. v. p. 334.

In England the annual rate of mortality in all ages was, by the returns of population in 1811, found to be ..... 1 in 49

Idem, p. 334.

But the mortality of persons in the prime of life is estimated to be about one half of what it is in the whole population of all ages; or, ... 1 in 98

Idem.

The average annual rate of mortality from disease in the navy, during the years 1811, 1812, and 1813, is estimated at about ..... 1 in 42

Perhaps the annual ratio of the mortality of troops serving in Great Britain may be estimated at about 1.37 per cent. This estimate is made from limited data, and may therefore differ a little from the real annual average.

According to this ratio per cent. the annual rate of mortality will be ..... 1 in 73 *

With the preceding data the following statements of the mortality of some regiments serving to the eastward of the Cape of Good Hope may be compared:

19th Regiment, average mortality annually during a period of twenty years and ten months, per cent. ... 7.2, or 5.2 in 73

See Appendix, No. II.

34th Regiment. Annual average mortality during a period of eleven years and eight months, per cent... 8.2, or 5.9 in 73

See Appendix, No. III.

* It is probable that the mean annual ratio of mortality among troops employed in Great Britain has been estimated a little too high, namely, one in seventy-three. Having been kindly permitted, by Sir James M'Grigor, to examine some of the records of the Medical Board, I found that, from the 21st June 1817 to the 20th June 1820, the average strength of the troops stationed in North Britain was 3541. During the above period 83 died, being an annual mortality per cent. of $\frac{7.9}{100}$, or one death in 128. There was one death in every 93 treated in hospital.

45th Regiment. Mortality of one year (1820), per cent. ..... 5, or 3.8 in 73
See Appendix, No. IV.

69th Regiment. Average mortality of fourteen years and five months, per cent..... 8.3, or 6 in 73
See Appendix, No. V.

73d Regiment. Average mortality of three years, per cent. ..... 25.5, or 18.6 in 73
See Appendix, No. VI.

83d Regiment. Average of three years, per cent. ..... 8.6, or 6.2 in 73
See Appendix, No. VII.

According to these statements, the ratio of the mortality of troops in India is much higher than the ordinary rate of the mortality of troops in Great Britain. But more facts are required before a general conclusion can be drawn on this important subject.

The proportion of invalids must be much greater among troops employed in a tropical climate, or to the eastward of the Cape, than among troops on duty in Great Britain.

I have subjoined two anonymous paragraphs which appeared in the Madras Courier. They are both intimately connected with the subject under examination, namely, the probable duration of the life of Europeans in India. See likewise Appendix, No. IX.

"TO THE EDITOR OF THE MADRAS COURIER.

"SIR,

"The following result of a calculation may amuse some "of the numerous readers of your valuable paper, affording "consolation to those who have been long resident in India. "It is a medium taken from the number of casualties that "have occurred in the space of the three last years, in a class "of the European society the most exposed to the climate.

"Of 1366 European gentlemen, 115 died in the above-
" mentioned period, not quite 4 per cent. per annum.

" Supposing the above were divided into three classes, the
" casualties have taken place nearly in the following propor-
" tions.

EUROPEANS.		
FIRST CLASS.	SECOND CLASS.	THIRD CLASS.
Residence in the Peninsula of 12 years & under.	Residence in the Peninsula of 12, and not exceeding 18 years.	Residence in the Peninsula of 18 years and upwards.
Nearly $4\frac{2}{3}$ per cent. per annum.	Something less than $3\frac{1}{8}$ per ct. per annum.	Rather more than $2\frac{1}{2}$ per cent. per annum.

" I am, Mr. Editor,

" Your very obedient servant,

" MILES.

" October 21, 1816."

" The following statement will show what unusual mor-
" tality has prevailed in the peninsula during the last year.

" MORTALITY IN INDIA.—Great has been the mortality by
" death in the peninsula of India, during the last twelve
" months, among the European residents. We have it from
" very competent authority, that the casualties in the Madras
" army for the year ending 1st of August 1820 have been un-
" commonly numerous, and that they have fallen nearly in the
" unprecedented proportion of 6 per cent.

" Of 1260 European officers, the casualties by death, in
" twelve months, have amounted to 74.

" The cavalry has lost in the proportion of nearly $6\frac{1}{3}$ in " the hundred.

" The artillery in the proportion of only $3\frac{1}{8}$ per cent.

" The engineers—none.

" The infantry nearly in the proportion of $6\frac{1}{4}$ per cent.

" Medical officers upwards of $6\frac{1}{3}$ per cent.; these latter " having suffered more than any of the other classes enume- " rated!"

PART III.

BRIEF REMARKS ON THE PREVAILING DISEASES.

CHAPTER I.

Endemic Fever.

Except among the detachment stationed at Minery, in the months of May and June 1815, fever did not greatly prevail among the troops employed in the Kandyan country during the years 1815, 1816, and 1817. On a reference to the returns for the years 1818 and 1819, it will appear that fever proved fatal to a great number of Europeans. The type of the fevers which prevail in this country is commonly either remittent or intermittent. Having the same origin, and being different rather in degree than in kind, I have, in the returns of casualties, classed these two varieties of disease under the head Endemic Fever. The distinction between remittent and intermittent fever is often equivocal, inasmuch as cases sometimes commence as intermittent which become remittent, and then again intermittent. Fevers of a remittent type occur more frequently among Europeans than among the other classes of troops.

Sometimes fever supervenes rapidly, at other times a state of indisposition of several days' continuance precedes a violent development of the disease.

The following are the leading symptoms of remittent fever: loss of appetite, listlessness, dorsal pains, alternate sensations of heat and cold; to these symptoms succeed ardent heat over the whole body, headach, thirst, anxious breathing, white

tongue, uneasiness in the epigastrium, sometimes a full quick pulse, nausea, and in some instances vomiting. After a longer or shorter period, the fever remits commonly with a moistness of the skin. For the most part, a remission supervenes within twenty-four hours after the accession of the fever. The forenoon is the ordinary period when the violence of the symptoms abates. After a few hours' remission, the febrile symptoms recur often with increased violence. In this manner exacerbations and remissions succeed each other. Sometimes several remissions and exacerbations occur in one day.

As the disease advances, the remissions are frequently scarcely perceptible, the tongue becomes covered with a brown or blackish fur, the skin yellowish, clammy, and cold where it is exposed to the air, the pulse small and quick. In this stage of the disease, nausea and vomiting are often distressing symptoms: eventually delirium, hiccup, subsultus tendinum, and sometimes coma, supervene.

Fever occasionally proves fatal by the fifth or sixth day. In general, however, it does not terminate in death before the tenth day of the disease.

Sometimes a gradual abatement of the symptoms is followed by a state of convalescence; at other times the disease assumes the form of a tertian or quotidian intermittent.

Relapses were very frequent during the year 1818. In many cases this circumstance was occasioned by an early return to fatiguing duty. But relapses happened without any apparent cause. No where were they more frequent than at Kottabawa. At this station, when fever supervened after a period of apparent convalescence, the patient often complained of dizziness, and greatly diminished power of loco-motion; to these symptoms were eventually superadded great restlessness, increased heat, quick pulse, urgent thirst, delirium, vomiting, yellowness of the skin, severe pain of the thighs, legs, and feet. Syncope, hiccup, and diarrhœa were frequently the immediate precursors of death.

Anasarcous symptoms supervened more frequently at Kot-

tabawa, and much sooner after the accession of fever than in other districts of the Kandyan country. The surface of blistered parts did not there heal readily. Sloughy patches appeared upon the blistered surface; the patches frequently increased, and in a short time occupied the whole extent of the skin which had been deprived of the cuticle.

The casualty returns show that the bodies of a great proportion of those who died from fever were inspected after death. In cases where the disease terminated rapidly, there were very seldom any remarkable changes of structure observed. Even when the progress had been considerably protracted, many cases occurred where the structural derangement was apparently of little importance. The morbid structure discovered on dissection was rarely of such a degree as to appear to be the immediate cause of death. Although the structural change of organs appears to be rather a consequence than a cause of fever, any material disorganization of the viscera of the thorax or abdomen must have a powerful effect in protracting recovery and occasioning relapse.

Brain.—The more common changes in the structure and contents of the brain which have been found upon inspecting the bodies of those that died of fever, were serous effusions under the dura mater, or between the arachnoid coat and the pia mater; increased vascularity of the membranes and substance of the brain, and an unusual quantity of aqueous fluid in the lateral ventricles.

The inferences that may be drawn from morbid appearances discovered on dissection are often extremely ambiguous. I fear the subject is too obscure for us to hope that much certainty will ever be obtained. No where is the difficulty more conspicuous than in inspections of the brain and its membranes.

There is often very little connexion between the symptoms of disease and the existence of serous effusions between the membranes of the brain. Frequently a considerable degree of effusion (sometimes to the extent of two or three ounces)

was found in the brain, although not a symptom of an affection of that organ had appeared during life. This quantity of serum was sometimes found in the brain of those who had died of dysentery and other diseases where an affection of that organ was not likely to have existed. At the same time cases occurred where coma and other symptoms of oppressed brain were remarkably manifest, while (upon inspection of the contents of the cranium after death) no unusual effusion of serum was found, nor were the membranes or structure of the brain uncommonly vascular. In patients who died anasarcous there was generally a considerable quantity of serum found in the brain. Where the skin had become yellow before death, the aqueous fluid found in the ventricles and between the membranes of the brain had a yellowish tinge. The serous effusion found under the arachnoid coat has generally a whitish appearance while in situ.

In regard to the degree of vascularity of the pia mater, which may be considered morbid, there is often much ambiguity. On this delicate subject different observers not unfrequently draw discordant conclusions. Unless where there is an effusion of coagulable lymph giving rise to thickening of parts and unnatural adhesions, or where there are changes in the structure of organs evincing a tendency to ulceration or sloughing, the other marks of pre-existing inflammation are liable to considerable uncertainty. Vascular turgescence has, I fear, been sometimes mistaken for traces of inflammation. This turgescence may frequently be attributed to the depending position of the organ or portion of the organ under examination. But there is another source of fallacy in regard to morbid appearances which requires attention. I allude to the transudation of the contents of veins, by which means the adjoining parts assume a reddish colour. Membranes coloured in this manner may, if not carefully examined, be conceived to evince traces of inflammation. This source of error is best obviated by an early examination of the body after death. Fluids transude through their containing membranes very

soon after life becomes extinct. Another consequence of death is the infiltration of fluids into the different textures of the body. Coloured fluids, such as blood, thereby tinge the neighbouring parts, and give them an appearance which may be mistaken for marks of inflammation. As the decomposition of animal substances is more rapid in a high than in a low temperature, it may be inferred that the transudation and infiltration of fluids occur sooner after death in warm than in cold climates: hence the necessity of conducting the inspection of bodies soon after death. At Kandy the bodies were, for the most part, examined between six and twelve hours after death; and I believe the inspections were not longer delayed at the other hospital stations.

Thorax.—Portions of the lungs were occasionally found gorged with blood. When divided by the scalpel, a frothy serum exuded in a number of cases. Some cases occurred where the lungs were found a little denser than natural.

Abdomen.—The liver frequently evinced a deviation from healthy structure: sometimes it was unusually red, at other times the colour was darker than natural; occasionally the organ appeared gorged with blood, and sometimes it seemed to contain less of that fluid than usual. Of fifty-five livers belonging to Europeans that died of fever, twenty-five were deemed sound. The average weight of these livers was 4 lb. 6½ oz. The extremes were 6 lb. and 3 lb. 7 oz. Twenty-seven appeared unusually soft: the average weight of this member was 4 lb. 15 oz.; the largest weighed 6 lb. 8 oz. the smallest 3 lb. 13 oz. Two were found indurated: one weighed 2 lb. 10 oz. the other 10 lb.

The gall-bladder contained bile, which differed considerably in appearance; sometimes it was found watery, at other times brown or coffee-coloured, and often resembling pitch in colour and consistence.

Large Intestines.—The villous coat was sometimes found dark red and pulpy: occasionally incipient ulceration had taken place.

Spleen.—This viscus was frequently found unusually large; sometimes it appeared to be filled with grumous blood. The enlargement of the spleen did not appear to be connected with a small liver. In the case of fever where the liver weighed 10 lb. the spleen was found to weigh 4 lb.

Remittent fever frequently occurs in all sultry climates, particularly if they are uncleared and over-run with forests or low brush-wood. The neighbourhood of extensive swamps or half-inundated flats is found to be often highly pestilential. In every part of Ceylon the remote cause of fever is therefore abundant. But fever is not always found to prevail in proportion to the apparent exuberance of the phenomena which are supposed to occasion it. Sometimes fever is very general among the inhabitants in particular tracts of country where the causes which are supposed to produce it do not appear to exist in any remarkable degree. Both dysentery and fever are occasionally found to prevail in particular stations on the coast where marsh miasmata do not appear to be abundant; and where, from the vicinity to the ocean, it might be supposed that the atmosphere of the land, if unhealthy, would be rendered much less so by the breezes from the sea. Hence, in as far as regards the remote origin of fever, it is necessary to speak in very general terms *.

In Ceylon, and perhaps in all tropical climates, the operation of the exciting causes of disease has a powerful influence in occasioning fever. Fatigue, exposure to variable weather, insolation, privations, intoxication (when excessive), are very frequently followed by fever or some vicarious disease, such as dysentery or ill-conditioned ulcerations of the lower extremities.

With regard to the treatment of remittent fever, the practice adopted by the medical officers was commonly antiphlogistic. In the early stage of the disease venesection was very generally resorted to, particularly if there was much vascular

* See Appendix, No. VIII.

excitement and considerable reaction of the system. Sometimes the operation was repeated, when the symptoms became violent. Cathartics were regularly administered, so as to keep the bowels free. The increased heat of the skin was moderated either by the affusion of cold water, or by frequently sponging the body with it.

The early and repeated use of the lancet seldom failed to abate the violence of the most urgent symptoms of fever. Frequently, however, although the symptoms were meliorated, a fatal issue of the disease could not be averted. There are some grades of tropical fever which appear to be almost beyond the power of medicine. But the fatal tendency of the disease is often not in proportion to the apparent violence of the symptoms. Sometimes cases terminated fatally without the appearance of a very violent disease. The danger was often great, although the symptoms appeared mild.

When bleeding, purgatives, and cold ablution failed to arrest the progress of the disease, all that could, in general, be done was to endeavour to alleviate symptoms. In the advanced stage of fever, active medicines have a very uncertain influence in contributing to a cure. The inefficacy of medicine in cases which did not come early under medical treatment was rendered very evident by the nature of the duties of the troops in 1818. Men were frequently admitted from the field who had suffered under fever for a considerable period. Medical means were in these cases often of little avail. Much could, however, be done for the comfort of the sufferers. The relief they expressed after careful ablution, and particularly after the operation of a purgative, was often remarkable. Occasionally they said they were free from all uneasiness. The absence of suffering was, however, found to be often but a very equivocal indication of perfect convalescence.

The following case, which was drawn up by Assistant Staff-surgeon Nicholson, will show the progress of fever, and a practical adoption of the means recommended for its cure.

Case of ROBERT BRUIN, *45th Regiment, Æt.* 28.

Of a spare habit; has been seventeen months on the island, and has generally enjoyed good health. Admitted into hospital on the forenoon of the 11th November; said that he had been attacked that morning, after he had been relieved off guard, with headach, pains, and weakness of the extremities. Pulse was quick, tongue foul, skin natural. Was bled on admission, to the extent of 3 lbs. and a purgative administered; towards evening he was attacked with urgent febrile symptoms and renewed headach: a blister was applied to the nape of the neck. On the following morning the symptoms had remitted, and he was quite free from headach: the purgative was rejected; he was allowed an acidulous drink: febrile symptoms recurred that evening with less severity, but accompanied with great irritability of the stomach: he continued from that date (13th) to have an evening accession of fever, and was almost constantly affected with nausea and vomiting. Purgative remedies were daily administered, which produced free purging. During the increased heat of the body, cold ablution was used, and acidulous drink prescribed. On the 19th, the fever recurred with increased violence, and the vomiting continued almost incessantly: at that period he became much exhausted; pulse quick and small; tongue dry and brown. Saline diaphoretic draughts, with a few drops of tinct. opii in each, were now ordered—allowed two gills of wine. On the evening of the 21st, the usual accession of fever took place: he expired next morning at three o'clock.

Appearances on Dissection.

Cranium—Dura mater preternaturally red, pia mater natural, substance of the brain apparently healthy, ʒfs of fluid was found in each lateral ventricle, ʒfs in the base of the cranium.

Thorax—Viscera all natural.

Abdomen—Viscera healthy; liver weighed 4 lbs. 13 oz. spleen 1 lb. 3 oz.

The body was examined seven hours after death.

CHAPTER II.

Inflammation of the Liver.

It is, I believe, a very common opinion, that an excessive secretion of bile is general in warm climates. Upon what foundation is this opinion assumed? With regard to Europeans in health, I have not been able to observe any remarkable difference between the secretory functions of the liver in a tropical climate from that of the same organ in high latitudes; and with respect to the indigenous inhabitants of intertropical regions, I am not convinced that the biliary secretion is unusually copious.

It may be observed, that the cholera morbus of the systematic writers, a complaint which is supposed to arise from an inordinate secretion of bile, very rarely occurs in Ceylon, either among European residents or the indigenous inhabitants.

The diseases which have been attributed to a diminished secretion of bile, such as hypochondriasis and dyspepsia, are rare among the troops of all classes in Ceylon; and I have not learned that the natives suffer from these complaints.

Inflammation of the liver is here not an unfrequent disease. European soldiers are more liable to this affection than the other classes of troops; no class, however, is entirely exempted from it.

Among Europeans, and particularly among new arrivals, this disease supervenes, sometimes with well-marked symptoms, namely, considerable febrile excitement, urgent thirst, and violent pain in the region of the liver. The pain of the liver is generally increased by pressure. The following symptoms are frequently concomitants of diseased liver, but not always; vomiting, cough, impeded respiration, in-

creased pain when lying upon the left side, pain on the top of the right shoulder, diarrhœa, costiveness. In one instance, a patient, suffering under inflammation of the liver, was for a period of several days unable to move his right arm; the hand was at the same time swelled and painful.

Sometimes, particularly among individuals who have been long assimilated to a hot climate, the symptoms which precede and accompany the formation of an abscess of the liver are very little noticed; not unfrequently they pass entirely unobserved. This circumstance is particularly remarkable, when inflammation of the organ is combined with inflammation of the villous coat of the large intestines, giving rise to dysenteric symptoms.

The progress of inflammation of the liver is sometimes very rapid. In general it terminates either by resolution or by the formation of an abscess or abscesses in the parenchymatous substance. The degree of rapidity with which pus forms in the liver is not in proportion to the local uneasiness or vascular excitement of the system. There is much reason for supposing that an abscess sometimes forms in the liver as rapidly without local pain as when the uneasiness is very great.

Death, I believe, occasionally happens from inflammation of the liver before a suppuration has taken place in its substance.

The following post mortem traces of previous disease in the liver have come under my observation.

A mottled hue of the peritoneal coat of the liver. Sometimes the whole viscus is dense, dark red, occasionally approaching to a mulberry tint. This dark shade of the peritoneal coat appears to indicate a passive engorgement of the vascular system of the gland. In this state of the organ, when a section is made through it, a large effusion of dark-coloured blood issues from the divided surface. By this means the gland becomes more flexible, as well as reduced in size. As this gorged state of the liver is generally unattended with the effusion of coagulable lymph, either into the sub-

stance of the gland or externally over the peritoneal coat, I am not disposed to consider it a mark of active inflammation.

In some very rare instances, where symptoms of inflammation of the liver had existed during life, the peritoneal coat was found unusually red, and the blood-vessels containing florid blood. Three cases of this kind occurred in 1818, and are included in the return of casualties, under the head Hepatitis. The traces of inflammation are often not equally perceptible through the whole of the organ. In one case, a portion of the convex surface was found redder and denser than the concave surface. When the gland was extracted it weighed 5 lbs. 6 oz.

The liver is not uncommonly found adhering to the neighbouring parts: generally, however, the chief points of contact are the stomach and intestines: sometimes the convex surface of the liver is found adhering to the peritoneal lining of the parietes of the abdomen. The extent of adhesions of this kind, which have come under my view, has never been great.

When an abscess is found in the liver, it is generally either in the right or left lobe. It does not often occur that both lobes infold one abscess, or that an abscess is formed in each lobe. There are, however, many exceptions to these observations. Sometimes the quantity of pus found in the liver was very great. I once found ten measured pints in a single abscess. Occasionally the liver contains a great number of abscesses, some of them not larger than peas, while others are as large as a hen's egg. When the abscesses are very numerous, the white purulent contents often appear shining through the peritoneal coat, particularly upon the convex surface.

The existence of a large abscess in the liver is sometimes discovered by inspection of the external surface. A protruding convex spot is observed, which, when pressed by the finger, feels softer than the other parts of the organ. Sometimes the protrusion is whitish, in consequence of the shining of the purulent matter through the peritoneum. Often, how-

ever, neither careful inspection nor manual investigation can discover the existence of a pretty large abscess. The structural derangement is, in these cases, not ascertained until a section is made through the abscess with a scalpel.

The fluid contents of abscesses of the liver are in general well-digested pus. The inner surface of the abscess is generally very unequal, and has the appearance of an ulcer, thickly covered with purulent matter. For about a third of an inch from the ulcerated surface, the substance of the liver appears unusually red, and generally this portion is a little indurated. Beyond that limit there is commonly no mark of previous disease in the substance of the gland.

Sometimes an abscess contains a serous whey-coloured fluid, with flakes of tenacious lymph or purulent matter floating in it. In some cases, where two abscesses were found in the liver, I have seen one filled with pus, while the other contained a fluid resembling the serous and colourless part of milk. The lining of the serous abscess is smooth and apparently organized. After macerating the liver for some days, I have, in two instances, succeeded in peeling off the membranaceous substance, below which the liver was smooth and seemingly sound.

Upon inspecting the bodies of two men who died of dysentery in Kandy, abscesses were found in the livers, containing ill-conditioned offensive sanies. In both these cases the walls of the abscess were in a state of gangrene. At a little distance from the seat of the abscess, the substance of the liver showed no traces of disease. Except these two cases, I have not observed a tendency of the liver towards mortification.

During the formation of pus, the liver is probably increased in substance, exclusively of the purulent matter secreted in the organ.

The following abstract of the structural derangement, found upon inspecting sixteen bodies, supports this conjecture.

	No.	Names.	When died.	Quantity of Pus found in the Liver.	Liver weighed exclusively of the Pus.
			1819.	lb ʒ	lb ʒ ʒ
EUROPEAN.	1	Thomas Hickey	21st July	1 0	3 10 0
	2	Richard Knowls ...	26th ditto	0 14	3 5 0
	3	Francis Stillard	28th ditto	1 0	4 10 0
	4	Thomas Arnold	24th August	4 0	3 15 0
	5	John Russell	26th ditto	1 0	4 6 0
			1820.		
	6	James Young	16th January	1 0	4 12 0
	7	John Marr	4th May	1 0	3 10 0
	8	Samuel Taylor	1st June	Contents of the Abscess had passed into the Stomach.	4 13 4
	9	Michael Callaghan ..	18th December	3 8	6 8 0
			1819.		
CAFFRIE.	10	Leuis	23d January	2 0	5 12 0
			1820.		
	11	James Leuis	28th January	3 0	4 0 0
	12	Corporal F. De Queen	12th May	7 0	4 8 0
	13	Francisco Narcies ...	24th ditto	0 3	3 2 0
			1820.		
INDIAN.	14	Sido	15th January	0 8	3 9 0
	15	Jumeer Adeen	19th February	2 0	4 0 0
	16	Vansalum	9th October	2 0	2 4 0

The contents of abscesses in the liver sometimes pass upwards through the diaphragm and air-cells of the lungs, and are expectorated. When this occurs, the liver, diaphragm, and lungs are united together by adhesive inflammation. Sometimes the abscess penetrates deeply into the right lobe of the liver, and occupies a great portion of it. At other times that part of the liver which is immediately contiguous to the diaphragm presents a wide hollow, but not a very deep ulcer, the lung being at the same time firmly attached to the margin of the excavation. In these cases the diaphragm is found destroyed to the extent of the ulerated surface, and the lungs greatly disorganized. Recoveries sometimes occur after the contents of an abscess in the liver have passed through the lungs. This fortunate circumstance happens, I believe, but

rarely, except in cases where the abscess is small, and the consequent inflammation of the lungs not very extensive.

Death generally takes place in abscess of the liver before the contents escape from the viscus. In some very rare cases, upon inspecting the cavity of the abdomen, an abscess of the liver was found to have burst, and the purulent matter lying between the folds of the intestines. The rupture of the abscess may, however, in these cases, have happened after death, by incautiously moving the body.

In one case which came under my observation, the left lobe of the liver adhered to the stomach, and part of the contents of an abscess had passed through a large opening from the former into the latter viscus. I have not had an opportunity of witnessing the dissection of a single case where an abscess of the liver found an exit through the parietes of the intestines; nor am I aware of a cure having been effected in this manner. No case has come under my notice, in the Kandyan country, among any of the classes of troops, where it was deemed advisable to open a passage for the contents of an abscess in the liver through the parietes of the abdomen. Some cases of abscess of the liver occurred in Kandy; where, in consequence of a bulging appearing under the false ribs of the right side, during life, it was supposed that a considerable adhesion might have taken place between the liver and the parietes of the abdomen. Dissection after death showed, in every case of this kind, that the connexion was not sufficiently intimate to render an operation for evacuating the contents of the abscess successful. I have performed this operation in three cases at Colombo: one case was a Malay, the other two were natives of the island. They all did well. The abscesses were comparatively small; the largest contained about 14 oz. of pus. It is only when the abscess is small that a recovery can with any degree of confidence be expected, by affording a passage for its contents externally.

The liver is sometimes found softer than the natural texture of the viscus. In a number of instances the structure

was not otherwise remarkably changed. Other cases occurred where the parenchymatous substance had undergone considerable alteration. In some, the peritoneal coat was easily peeled off from the glandular substance, which was frequently granular, and had lost much of its natural tenacity. Sometimes the substance of the gland was friable, and easily divided by the fingers. A soft and granular state of the liver sometimes accompanies dysentery. In one case it appeared to exist during perfect health. Corporal Parsons, 83d regiment, a stout, healthy, corpulent man, dropped suddenly to the ground one morning, at 7 A. M. He was brought to the hospital, and bled to the extent of about 4 lbs. Other means of cure were likewise used. He died in about forty-eight hours after the first appearance of disease. The liver weighed $7\frac{1}{4}$ lbs.; the peritoneal coat separated easily from the parenchymatous substance, which had a yellowish colour. In texture it was granular, and so pulpy as nearly to crumble to pieces by means of its own weight. It was observed by a gentleman present, that the pulpy substance closely resembled hasty pudding. From the result of this case, we may infer that the functions of digestion and assimilation may be carried on while the liver is greatly disorganized. No marks of pre-existing disease were discovered in the brain.

The liver is occasionally found harder than natural. When a section is made of its substance, the scalpel conveys a feeling of hardness or grittiness. Two very remarkable instances of this kind came under my observation. In both cases the liver was found round, like a ball, and had no appearance of lobes. The substance of one was hard and semi-cartilaginous: the other was preserved entire. One weighed 3 lbs. the other 4 lbs. The immediate cause of death, in one case, was dysentery; in the other it was remittent fever.

I have had an opportunity of examining the bodies of several men, who were great drunkards and who died suddenly. By this means I was able to ascertain the apparent structural derangement of the liver in these cases, uninflu-

enced by acute disease. The livers had all a yellowish colour, and contained very little blood: several of them communicated a gristly sensation, when a section was made into their substance. In some instances the texture was loose and granular, in others the substance was seemingly increased in solidity and tenacity. The weight of the organ was generally about 5 lbs. Have the livers of drunkards with sallow countenances generally these appearances?

The weight of livers in different individuals is subject to considerable variety; hence the term "enlarged," when applied to the liver without morbid structure, is very ambiguous. The livers of European soldiers have been found to vary in weight from 2½ lbs. to 5 lbs. without any satisfactory trace of pre-existing disease.

It is often difficult to discover, during life, the nature of the morbid structure of the liver. The following symptoms are strongly indicative that the structure of the gland is materially changed from its healthy state: a tumid state of the abdomen, with a particular fulness, and sometimes a tenderness of the right hypochondrium; an ex-sanguine countenance; sometimes yellowness of the skin; loss of appetite; impaired physical strength; low spirits; emaciation; disturbed sleep; a sense of weight or uneasiness on the right side, and irregular bowels. But these symptoms accompany an abscess in the liver, as well as an induration of its substance without abscess. Even in these patients there is seldom any thing very satisfactory learnt respecting the texture or consistence of the organ, by examining the right hypochondrium. In this respect, manual investigation gives less assistance in ascertaining the nature of the disease than might be expected. Much caution is therefore required in forming a prognosis in certain morbid states of the liver.

Both new arrivals and old residents occasionally complain of an uneasiness of the right side, or epigastrium, which they very generally refer to the liver. Sometimes the affected describe their sensations to be as if there was a considerable

increase of heat in the part; at other times they complain of a sense of weight. I have seen a few cases where the chief complaint was an occasional feeling like hot water trickling along the side. Some of the above symptoms not unfrequently follow excess in eating and drinking, particularly if the regular hours of sleep are invaded. In addition to the above uneasy sensations, there is often some disturbance of the functions of the stomach; the appetite is impaired, and the bowels are irregular.

The functions of the liver may be interrupted or disturbed when the above morbid sensations supervene; but as the symptoms often yield to repeated purgatives, it may be inferred that a disordered state of the chylopoietic viscera is an important cause of the uneasy feelings. The hypothetical error of attributing almost every indisposition in this country to an affection of the liver, and to the equivocal something called "bile," has in practice no very prejudicial influence. All ranks know the advantage of occasional purgatives; and, under every deviation from health, this class of medicines is generally resorted to. Whether the beneficial effects of purgatives, in certain diseases, are to be attributed to their "agency in correcting a failure in the functions, and "irritation of the digestive organs;" "or to the influence "they have to evacuate the contents of the bowels; which, "being out of the course of the circulation, are in a manner "already extraneous to the body," I do not pretend to decide. Their utility on many occasions is undoubted; and perhaps cases where they are required more frequently occur among Europeans in tropical regions than among the same class of people in their native country. In warm climates the occupations are generally sedentary, and the food is frequently improper; there being rarely a due admixture of fresh vegetables used. These circumstances may occasion an irregularity in the alvine evacuations. The relief which is frequently afforded by the exhibition of purgative medicines, leads occasionally to a habitual and rather indiscriminate use of them.

Inflammation of the liver may be said to be endemic in Ceylon; or, in other words, it occurs there more frequently than in some other parts of the world, without our being able to assign a satisfactory cause for the circumstance. There being, therefore, a permanent predisposition to the disease, the influence of the exciting causes may be expected to be very manifest. The more common exciting causes are, much exposure to the direct rays of the sun, and enduring fatigue in this situation; a variable atmosphere, and particularly sleeping during night on the damp earth; the habitual use of spirituous liquors; intoxication, and the irregularities that accompany such a state of mental derangement.

Hepatitis is to be distinguished from pneumonia and from inflammation, thickening and ulceration of the colon. Both these diseases have been mistaken for a morbid state of the liver. Inflammation of the lungs is sometimes intimately complicated with diseased liver. The former affection is seldom, however, contemporaneous with the latter. It is generally a consequence of inflamed liver. The increase of pain, by gentle pressure upon the region of the liver, is a strong indication of the morbid condition of that organ; while the absence of pectoral symptoms affords a presumption that the viscera of the thorax are free from inflammation.

A correct diagnosis of diseased liver, when complicated with dysentery, is extremely difficult. We know that frequent dejections of blood, mixed with mucus, almost invariably indicate an inflamed condition of the villous coat of the large intestines, and that dysentery is frequently combined with diseased liver. It is a remarkable circumstance, however, that when the large intestines are inflamed, the proofs of an excited state of the liver are very obscure. Indeed, the former affection seems to predominate so much, that the latter generally passes unobserved. Under this complication of disease, little is learned by pressure upon the hepatic region. The liver and arch of the colon are situated so contiguously, that

when pain is thus produced, we are at a loss to know whether it originates in the colon or in the liver.

The formation of a large abscess in the liver sometimes takes place without much indication of disease, in as far as the feelings of the patient are concerned. So little obvious, occasionally, are the symptoms which indicate a large accumulation of pus in this organ, that the pointing of the abscess outwards has been mistaken for a superficial collection of pus, and an opening made into it by means of a lancet. The issue of three or four pounds of purulent matter undeceived the operator.

When inflammation of the liver is attended with acute pain in the seat of the organ and much vascular excitement, blood-letting is strongly indicated. The extent to which venesection may be carried depends upon the violence and obstinacy of the disease. Blood should be drawn until the pain be greatly abated; and, upon a recurrence of the uneasiness, the operation ought to be repeated.

Purgatives consisting in part of calomel should not be omitted. Independently of the beneficial influence they may have upon the upper part of the intestinal tube, they are useful in lessening the force of the circulation.

The following case will show in practice the means which are recommended to subdue active inflammation of the liver.

February 9th, 1819. Lieutenant W. O. N. 83d regiment. Twenty-five years of age; habit healthy; has been but a short time in a tropical climate. Complains of violent pain in the right hypochondrium, which is greatly increased by pressure or motion; cannot lie on either side; reposes in a half-sitting posture; occasionally bends forward, resting his breast upon a pillow; respiration painful and difficult; pulse quick but not full; tongue white; costive.

Was seized yesterday morning with the pain in the side, which has been increasing since he first felt it: says that, for a week past, his appetite has been much impaired, during which period he has had a great desire to drink cold water.

Has, for several weeks, been much exposed to the direct rays of the sun, while superintending a working party.

Was instantly bled to the extent of 3 lbs.; became faintish while the blood flowed.

℞. Hyd. submuriatis,
Extract. col. comp.
Cambog. āā, gr. vj. M.

10th. Has passed a sleepless night; no stool; some pain of the side, but not very severe.

℞. Magnes. sulphatis ℥jfs.

Evening. In consequence of a severe aggravation of the pain in the side, was bled, about mid-day, to the extent of 2 lbs.; pain still considerable; some stools from the cathartic: twenty leeches to be applied to the side.

11th. No sleep during the night; breathes with much less pain than formerly; moving in bed gives him great uneasiness. To have a blister applied to the hepatic region.

℞. Hyd. submuriatis gr. x,
Pulveris jalapæ ℈j. M.

12th. Slept a little last night; some stools by the powder.

℞. Hyd. submuriatis,
Pulv. antimonialis, āā, gr. v. M.

13th. Had a little nausea after taking the medicine; has been perspiring freely all night; bowels free; he is now quite free from pain, and amusing himself by reading.

Evening. Had a severe relapse of the pain this forenoon, when it, for the first time, stretched to the top of the shoulder; was then bled to the extent of 3 lbs.: relief followed.

℞. Hyd. submuriatis gr. v,
Pulv. antimonialis gr. iij,
—— jalapæ gr. x. M.

14th. Had an accession of pain about midnight; has now very little uneasiness; perspired freely; considerable thirst; pulse 96; no stool from his medicine.

℞. Magnes. sulphatis ℥jfs.

Evening. The pain became again very violent about

mid-day; twenty-four ounces of blood were then taken from his arm; some stools from the salts; has now very little uneasiness.

℞. Hyd. submuriatis gr. x,
Pulv. antimonialis gr. iij,
Extract opii gr. j,
Syrup. q. s. M. Fiant pil. No. 2.

15th. Some disturbed sleep; pain of side still severe, which is greatly aggravated by motion in bed; pulse 100; no stool since last night.

℞. Magnes. sulphatis ℥j.

Evening. During this afternoon had a severe aggravation of pain; was then bled to the extent of 2 lbs.; bowels free; feels pretty easy. To take two pills similar to those he took last night.

16th. Had several hours' sound sleep; breathes with freedom, and can lie on either side without much uneasiness; pulse 108, not weak.

Blood drawn yesterday has no buffy coat; formerly it had always a thick coat of coagulable lymph.

17th. Took some salts last night; they produced several stools; a good night; expresses himself much better to-day; pulse 104; takes a little tea and toast occasionally.

Evening. Had an accession of fever this afternoon.

℞. Hyd. submuriatis gr. x,
Pulv. antimonialis gr. iij. M. Fiat pulvis.

18th. Slightly delirious last night; had some sleep this morning; bowels free; apyrexia.

℞. Decoct. cinchonæ ℔jfs.

To be taken in small quantities, as the stomach will bear it, during the day.

Evening.

℞. Hyd. submuriatis gr. x,
Pulv. antimonialis gr. iij. M. Fiat pulvis.

19th. Had an inconsiderable accession of fever last night;

some sleep this morning; is now in good spirits; bowels confined.

℞. Ol. ricini ℥j,
Aq. menthæ pip. ℥ij. M.

22d. Has been improving under the occasional use of purgatives, until last night, when he was attacked with a severe pain of the right side and shoulder; refers the chief uneasiness to that part of the side which is immediately below the nipple; forty leeches to be applied to the seat of the pain.

Mid-day. Pain still severe; to have a blister applied to the side.

23d. Pain greatly relieved; blister has risen well; from this time he continued to recover without medicine, except occasional purgatives. He was removed to Colombo in a convalescent state on the 1st March. His complete recovery was rapid and permanent.

Few cases having such acute symptoms as are detailed in the preceding history are met with in Ceylon. A medical attendant would require to be well acquainted with the rapidity of the progress of inflammation of the liver, and the almost certain fatality which follows the formation of an abscess in its substance, to induce him to adopt means sufficiently active to subdue a highly-excited state of the organ.

In the subjoined case the progress of inflammation of the liver was more rapid than generally occurs among natives of a tropical climate. The man was attended by Hospital-assistant Coghlan, who drew up the following report of his disease.

Vansalum Tanjore, a native of the peninsula of India, was admitted into hospital at Badula on the 23d September 1820.

Complains of acute pain in the epigastric region; breathing difficult; pulse quick and rather full; skin hot; tongue clean.

The pain in the epigastrium supervened about four hours since; bled to the extent of 2 lbs.

℞. Magnes. sulphatis ℥j.

Evening. Was much relieved by the bleeding; the pain has, within this half hour, returned with unmitigated severity: bled to the extent of 2 lbs.

24th. Pain at the epigastrium very severe, which is greatly increased by pressure; pulse feeble; skin hot; no stool from the salts. To have a blister applied to the seat of the pain.

℞. Magnes. sulphatis ℥j.

25th. Several stools from the salts. Pain at the epigastrium unabated.

℞. Hyd. submuriatis gr. iij,
Opii gr. fs,
Syrup. q. s. M. Fiat pil. No. 1.
Sumat ter in die.

October 7th. Gums painful, but no ptyalism; respiration very difficult; pain of the epigastrium continues.

9th. Expired.

Appearances on Dissection.

Liver.—In the right lobe, and pointing towards the convex surface, was found an abscess, which contained 2 lbs. of healthy pus; the viscus, except at the place where the abscess was situated, appeared healthy; there were no adhesions between the liver and the parietes of the abdomen. Liver, without the pus, weighed 2 lbs. 4 oz.

Should the antiphlogistic means of cure fail in arresting the progress of inflammation to suppuration, we have then little chance of being useful to our patient. Life is, however, sometimes protracted for a considerable period after the existence of an abscess is rendered extremely probable by a general fulness of the region of the liver, and by a bulging immediately below the ribs, which is, for the most part, on the right side. In one case of this kind which I had an opportunity of seeing, death had been expected for several weeks, when, one night, after a slight fit of coughing, a gush of purulent matter rushed up through the lungs into the throat, and nearly

suffocated the unhappy sufferer. The quantity of pus which had been expectorated during night was found to be about two quarts. It is impossible to describe the improved hopes of the patient which followed. Although he continued to expectorate daily from eight to ten ounces of pus, this circumstance gave him no anxiety. He thought the restoration of his health not only certain, but near at hand. While hectic fever was wasting him to a skeleton, he talked of the danger he had escaped, the progress of his recovery, and sedulously planned new schemes of life. In this state he survived for about two months. Hope did not forsake him until a few hours before death. The long-continued expectancy of recovery in this case is not singular. For the most part, I believe, where pus passes from the liver through the lungs, the unfortunate patient entertains a confident hope of recovery; which an excessive ejectment of pus and progressive emaciation are unable to suppress.

Should the acute symptoms subside without a return of health, and should there be no manifest proofs of the formation of pus in the liver, the use of mercury may then be tried, together with frequent moderate purgation. A mild degree of salivation is sometimes useful in this stage of the disease. When the liver contains an abscess, I suspect no quantity of mercury will cause ptyalism. Under such circumstances, the exhibition of mercury frequently occasions a soreness and heat of the gums, but rarely, if ever, ptyalism. Do other states of structural derangement of the liver (such as induration, or morbid softness) prevent the system from yielding to the salivatory operation of mercury?

CHAPTER III.

Of a particular Kind of Palsy.

In 1812 I had an opportunity of witnessing several cases of this disease among the men of the 4th Ceylon regiment, which was composed of Caffries. For the most part, it commenced with pain in the muscles of the thighs and legs, particularly of the bellies of the gastrocnemii. This uneasiness is usually attended by a general numbness of the extremity and an imperfect command of the powers of loco-motion. Sometimes the patients describe their sensations to be as if hot water or sand was running over the affected parts; at other times they complain of a sense of formication, accompanied with a pricking kind of pain. In some cases the hands and fore-arms became similarly affected. I never saw a case where the disease was confined to one extremity. In general, there was but little difference in the degree of the affection of the extremity of one side from that of another. In one case, the muscles situated on the back part of the neck became affected, and eventually the powers of articulation were much impaired. This last symptom admitted of partial alleviations. The appetite for food is seldom much impaired during the early stage of the disease.

When the disease has made considerable progress, the patient is unable to walk steadily. Standing or walking, in general, greatly aggravates the uneasiness of the limbs. The patients have an infirm tottering gait, and those whose hands are affected lose the power of feeding themselves. They seldom enjoy sound sleep, although they seem to labour under a sluggish inactivity and an unwillingness to exert themselves.

The progress of the disease is sometimes protracted to a period of several months. As the complaint advances, the

patients express their sensations of the affected parts to be as if they were dry or dead, and almost entirely without feeling. Loss of appetite, indigestion, and emaciation soon follow; the extremities lose the natural temperature; the extensor muscles become paralytic, while the flexor muscles seem to have some force, by which means the joints (particularly the joints of the fingers) become contracted. The pulse is frequent, thready, and fluttering; the vital functions greatly impaired; and eventually death supervenes.

The above is a description of this complaint in its most violent form. In this, as in every other disease, there are many gradations of severity.

This disease seems to be little, if at all, known among the indigenous inhabitants of Ceylon. I never saw one of them affected with it. Only one of the native doctors who reside in the neighbourhood of Colombo professes to have seen a complaint with the above symptoms. The cases he saw were all belonging to a body of Africans which Governor Van de Graaf imported into Ceylon. This importation occurred about the year 1782. According to report, a great number of the Africans died under the symptoms above mentioned.

The cases which I had an opportunity of seeing were chiefly Caffries belonging to the 3d and 4th Ceylon regiments. It is remarkable that natives of the island of Madagascar, many of whom belonged to the above corps, were not liable to this kind of palsy. New arrivals were much more liable to the disease than those who had become accustomed to the climate of Ceylon. Perhaps it is from this circumstance chiefly that more cases of palsy occurred among the Africans formerly than for some years back. I have not seen a case of it since 1816. There have been no Africans imported into Ceylon since 1812; hence the few who now survive are well inured to the climate.

Europeans are not exempt from a similar kind of paralysis In them the disease invades more suddenly than among Africans. A European artillery-man stationed at Tingall slept all

night in a house, the doors and windows of which remained open. Next morning, on attempting to get out of bed, he fell precipitately to the ground. He had completely lost the voluntary power of moving his inferior extremities: his legs were cold, benumbed, and but little sensible to external impressions. By the application of warmth and the constant use of frictions, some relief was soon obtained. Five weeks after the supervention of the disease in his legs and feet, his hands became affected. Frictions and warm clothing were adopted, and seemed to be useful. When six months after the commencement of the disease had elapsed, he had not entirely regained the use of his hands. He was then unable to hold a small object with any degree of firmness between his fingers. His feet were less warm than natural: he complained that they felt numbed and torpid. He could walk pretty well on a level road, but ascending or descending a hill gave him great uneasiness. During exercise he regained in part the sensibility of his feet, but the advantages of exertion were only temporary.

The general remote causes of this disease appear to be cold and moisture applied to the body, intoxication, and the excesses and irregularities consequent on inebriety; violent exercise in the sun; lying down in the open air during the heat of the day; exposure to the cold chilling dews of the night, and particularly by going to sleep in this situation; suddenly obstructed perspiration, by exposing the body but partially covered to a current of cold air; long fasting; and perhaps every circumstance which exhausts the human frame.

The greater liability of Africans to this disease than other classes of troops is perhaps owing to the very remarkable difference between the climate of Africa and that of Ceylon. The former is hot, dry, and but little subject to change; the latter is rainy, and comparatively very mutable. Deficient nourishment may likewise have its influence in occasioning palsy among Caffries. An African, accustomed only to the articles of nourishment found in his own country, requires

some time before he can relish and make the most of his rations. The total change of habits which an African recruit must undergo, his ignorance of the language of the country, added to many other circumstances, render him for a long time very helpless, and little able to provide for himself.

The African, although he possesses only an inferior degree of physical sensibility, seems to be fully as liable to the deleterious effects of sudden changes of temperature as Europeans. In this country his constitution is relaxed and inergetic. To some diseases he is more liable than other classes of people, who possess a tenser fibre.

Horses and dogs are sometimes liable to a paralytic affection of the extremities. I never knew any of them recover.

The indication of cure seemed to be to stimulate the general system, and to excite the circulation of the blood in the extremities. These appeared to be best fulfilled by an improved diet, friction of the affected extremities, warm bath, fomentations, moderate exercise, warm clothing, &c. Mild cases were, for the most part, much benefited by this treatment. Some, however, resisted every mode of cure. In these cases the symptoms became gradually more aggravated and less under the influence of medicine. Severe cases rarely recovered.

I presume this is the same disease which Dr. Bontius has described under the terms *barbiers* and *bereberii*. He says: "The inhabitants of the East Indies are much afflicted with a "troublesome disorder, which they call the *bereberii* (a word "signifying a sheep). The disease has probably received "this denomination on account of those who are seized with "it, from a tottering of the knees and a peculiar manner of "walking, exhibiting to the fancy a representation of the gait "of that animal." He describes the disease "as a species of "palsy, or, rather, a tremor; for, at the same time that it im-"pairs the sensation of the feet and hands, sometimes even "of the whole body, it induces a trembling. It is more es-"pecially the product of a rainy season. In general the dis-

" ease invades slowly: under particular circumstances, it at-
" tacks suddenly. Among the chief symptoms of this disease,
" is a lassitude of the whole body: the motion and sensation,
" especially of the feet and hands, are languid and depraved;
" and, for the most part, a titillation is felt in these parts, si-
" milar to what seizes them in cold countries in the winter, but
" with this difference, that the sensation in barbiers is more
" painful: the speech is sometimes so much obstructed, that
" the patient can scarce pronounce a syllable articulately.

The translator of Dr. Bontius's work states that barbiers "is
" most violent and frequent on the Malabar coast, where (espe-
" cially during the months of January, February, and March)
" it attacks those who unwarily sleep exposed to the land winds,
" which issue every morning, about sunrise, from the neigh-
" bouring mountains; suddenly seizing them with a painful
" sensation in the periosteum of the arms and legs. In some
" persons the pain abates as the day advances and the air be-
" comes warm; but in others it continues for a considerable
" time, attended with a weakness of the knees and an uneasy
" sensation in the calves of the legs and soles of the feet, es-
" pecially on any attempt to walk. It is scarcely ever cured
" by medicine till after the shifting of the monsoon, unless the
" patient can be removed to the coast of Coromandel or to any
" place to the eastward of the Baligat mountains, where, by
" the change of the air, they quickly recover."

Dr. Lind, in his account of the diseases incidental to strangers in different parts of the world, says: " Barbiers is a spe-
" cies of the palsy, a disease most frequent in India. It dis-
" tresses chiefly the lower class of Europeans, who, when in-
" toxicated with liquor, frequently sleep in the open air ex-
" posed to the land winds. Its attack is generally sudden,
" and entirely deprives the limbs of their motion: sometimes
" all the extremities of the body are affected; sometimes only
" part of them."

I have been informed by a native of Java, that a disease corresponding to the above symptoms is very prevalent among

the lower classes of the inhabitants of that island. According to him, Beriberi is the Malay name for the disease; leompoo is the name given to it by the Javanese. Beree, in the Malay language, means a sheep. (Marsden.)

This disease has not escaped the attention of nosologists. Sauvages defines it, "Motus gradientium genu retrahens cum "tremore, formicationis sensu, vocis raucedine. India famili- "aris." Linnæus defines barbiers, "Partium tremor, genuum "contractura, stupor, raucedo." Sagar adds to the definition of Sauvages, "Stupore dolorifico artuum." Dr. Aiken arranges the disease as synonimous with "contractura."

CHAPTER IV.

Dysentery.

Dysentery between the tropics runs a more rapid course, and is infinitely more fatal, than the same disease in a temperate climate. It is particularly intractable among Europeans.

During the primary stages of dysentery those who are affected with it complain more or less of pain of the belly. In some cases the pain is slight and transient; in others it is severe and nearly constant. The particular seat of the pain can often be traced along the arch of the colon; more frequently, however, the situation of the cæcum or the rectum is referred to as the place where the greatest pain is felt. There is often a fulness and sense of weight about the præcordia, which is increased by pressure. The dejections are frequent; sometimes they are, for a day or two, copious and watery, as in diarrhœa: as the disease advances, the tormina become more violent, attended with frequent dejections, which chiefly consist of mucus streaked or tinged with blood; sometimes distinct coagula of blood, having a loose texture, are passed. Except

occasionally, after the exhibition of a purgative, the evacuations seldom contain feculent matter. The pulse is sometimes full and hard, during the early stage of the disease; at other times an increase of vascular action is but little if at all perceptible. Occasionally some appetite for food continues during several days after the commencement of the disease. There is generally some thirst from the beginning of the complaint; this symptom increases, in fatal cases, to the hour of death. During the progress of the disease, the dejections become more and more frequent; less mucus is discharged, and eventually nothing is passed but a bloody brown fluid, which has a peculiar and an excessively offensive odour. The pain and uneasiness along the course of the large intestines become more constant, sometimes more severe, and occasionally attended with griping. Difficult micturition is not an uncommon consequence of dysentery, accompanied by a sense of heat in the urethra while the urine passes. The tongue becomes dry and overspread with a grayish or brownish fur. The teeth are covered with a black tenacious substance. The pulse is now frequent (generally above 100), small, and has a peculiar wiry hardness. The upper part of the body, particularly the head, is covered with profuse perspiration. Emaciation, with great prostration of strength, accompany these symptoms; the eye loses its lustre, and the whole countenance becomes dejected and cadaverous. Nausea, sometimes retching, and hiccup, now become distressing; the thirst more ardent. The desire to remain upon the close-stool is now nearly incessant; the dejections become, if possible, more offensive. Sometimes, under the existence of the above symptoms, the patient is favoured with an abatement of his distressing sensations. The release from pain sometimes excites hopes of permanent amendment. When a person in this state is questioned regarding his sensations, he frequently says he is free from uneasiness, and sometimes fancies he is recovering. This mitigation of affliction is only the precursor of death. The hiccup and retching continue, the pulse becomes nearly imperceptible,

the offensive brown fluid passes from the intestines involuntarily; delirium (which is sometimes only occasional) supervenes; death soon follows.

The above is a description of the disease as it occurs among Europeans. Sometimes it terminates fatally in ten or twelve days; at other times the progress is more protracted, and death does not take place before seven or eight weeks. The number of cases of long duration is, however, remarkably small. In 1817, nine cases of simple dysentery terminated fatally. The average number of days each patient was in hospital was twenty-eight. Two died on the eleventh day after admission; one survived to the seventy-first. There does not seem to be much difference in the fatal progress of dysentery, when complicated with diseased liver, from its course when apparently uncombined. During the same year, nine cases of dysentery united with abscess of the liver terminated fatally. The average number of days these patients were in hospital was twenty-two: one expired on the ninth day after admission; another lived to the fifty-fifth day.

During the year 1818, dysentery was much complicated with intermittent and remittent fever. Under this combination the period of the fatal influence of the dysenteric affection could not be ascertained with a satisfactory degree of precision.

The cases of dysentery were less complicated in 1819. During this year thirty cases of simple dysentery proved fatal. The average number of days they were under treatment was nineteen; the extreme periods when death occurred were the fifth and sixty-ninth day. Nine cases combined with abscess of the liver terminated fatally. The mean number of days they were in hospital was twenty-eight; the extreme periods were the third and fifty-ninth day.

It will appear by the Tables that dysentery has not been fatal to many among the Malays. In this class of people dysentery approaches insidiously. The symptoms are rarely what may be called acute. Extreme emaciation supervenes without urgent distress; sometimes without an evidently ade-

quate cause. The appetite for food continues not unfrequently during the whole course of the disease. The pulse is small and frequent in the advanced stage, and there is generally a considerable degree of thirst. The evacuations are not always very frequent; in some instances not above five or six in twenty-four hours. They are sometimes copious and feculent, alternating with a whitish puriform dejection: this whitish substance has not an offensive odour. Emaciation continues, and death occurs, apparently from inanition. Of twelve Malays that died of dysentery in 1819 and 1820, the average number of days each patient was under treatment was forty-two.

In the few cases of dysentery which have occurred among the Caffries, the symptoms have been fully as rapid in their progress as among Europeans. Nine fatal cases of dysentery occurred among the Caffries in 1819 and 1820. The average period they were under treatment was thirteen days.

Dysentery is sometimes not remarkably rapid in its progress among Indians. Generally, however, it runs nearly as rapid a course as among Europeans: during the years 1819 and 1820 twenty-eight cases of dysentery terminated unfavourably: the average number of days each case was under treatment was seventeen.

The advantages of post mortem examinations are numerous and important in almost all diseases. They are often highly useful by leading to an accurate diagnosis of disease, and thereby to a successful plan of cure. They are on other occasions of great importance, by enabling us to distinguish curable from incurable diseases. When diseases are of an incurable nature, it would be improper to commence or continue the use of powerful medicines. Alleviating remedies are alone advisable in such cases. Notwithstanding these advantages of morbid anatomy, it must be lamented that, on many occasions, the examination of bodies merely satisfies curiosity or displays the inefficacy of curative measures. To enable us to derive all the advantages from post mortem in-

spections which they are frequently capable of affording, the examinations should be made with great care. Some practice is required to distinguish the slighter shades of morbid derangement from the natural appearances and structure of organs. But, with all the necessary qualities for observing skilfully, and every desire to report faithfully, it is not always easy to convey to the mind of others correct impressions of morbid appearances. There is little that is absolute in the terms employed in morbid anatomy; they must, for the most part, be used in a comparative sense. Where a subject does not admit of precise and determinate terms in the delineation, wrong impressions may be unintentionally conveyed by the describer. Different reporters, from the difficulty of the subject, may report differently of similar appearances. Errors of this kind are more likely to be committed when the traces of disease are slight than when they are strongly marked. On that account I have, in the following enumeration of the morbid appearances discovered in dysentery, confined myself to a detail of the less equivocal marks of previous disease.

Upon examining the bodies of Europeans who have died of dysentery, the extent of structural derangement discovered is often very great.

Omentum.—This organ is sometimes found greatly diminished; more frequently it is found much thickened, interspersed with numerous vessels turgid with dark-coloured blood, and easily torn. Sometimes it adheres with great firmness to the intestines, occasionally stopping up ulcers. Perhaps it adheres more frequently to the cæcum than to any other portion of the intestinal tube.

Intestines.—The folds of the intestines are often found agglutinated together. Sometimes they adhere to the liver, and occasionally to the bladder. The colon appears studded or streaked with dark red or plum-coloured spots. Sometimes the contents of the intestinal tube are found in the cavity of the abdomen, they having passed through a gangrenous

orifice in the coats *. When handled, the large intestines feel thick, heavy, and lumpy: they are likewise, in many instances, easily torn.

Upon removing the intestines from the body and slitting them up through the whole extent, a great number of lumbrici are commonly found; but, as worms exist so generally in the intestines of Europeans in this country, their appearance cannot be considered as connected with dysentery. The inner surface of the duodenum is found covered with a viscid glairy semi-fluid substance, which has sometimes a yellowish, sometimes a greenish colour. Towards the inferior half of the ileum, small quantities of fecal matter are occasionally found, having a bright yellow colour and some degree of consistence. The contents of this intestine frequently resemble the healthy alvine evacuations of young children. The colour and consistence of the fecal contents of the ileum are suddenly changed immediately upon passing into the cæcum. Nothing is ever found in the large intestines but a brownish offensive fluid, similar in appearance to the watery dejections which mark the last stage of dysentery. The intestines were never found to contain either scybalæ or fecal accumulation.

* This, however, is not a frequent circumstance. Ulceration of the peritoneal coat is generally preceded or accompanied by an effusion of coagulable lymph, by which means the ulcerated spot adheres to some adjoining viscus: hence a patent opening from the intestinal canal into the cavity of the abdomen is seldom found, even in cases where the different coats of the intestines have been ulcerated through. The orifice is generally not discovered until an attempt be made to lift up the omentum, or to separate the folds of the intestines from one another. I recollect an instance of a case of violent dysentery where the intestinal evacuation ceased altogether for three or four days before death. On dissection, a large gangrenous orifice in the sigmoid flexure of the colon was discovered. Through this orifice the contents of the colon had passed. The convolutions of the intestines adjoining to the orifice were agglutinated, and formed a kind of sac, thereby preventing a general diffusion of the extraneous matter into the cavity of the abdomen.

The coats of the small intestines are generally healthy; sometimes they are redder externally than natural: this redness appears to originate from venous effusion rather than from an actively-excited state of the vascular system.

The mesocolon is frequently found much thickened, and containing a great number of vessels gorged with blood.

The chief traces of disease are found in the large intestines. The villous coat of the cæcum, colon, and rectum, when expanded, sometimes appears dark red and extremely turgid; the turgescence is occasionally so great as to resemble the tumid state of the inflamed conjunctiva during a violent degree of purulent ophthalmia. Sometimes the villous coat appears, at a little distance, to be covered with a bluish puriform fluid, and thickly interspersed with dark grumous spots and patches. When more narrowly examined, the villous coat is found to owe the appearance of being covered with puriform matter to an extravasation of fluids into the substance of it, by which means it acquires a swollen and pulpy appearance. The dark-red grumous patches are portions of the villous coat in a gangrenous state. These spots are generally surrounded by a red circle, the areas of which are various: frequently they are not more than about a third of an inch. Sometimes an individual slough may be compared to a tainted oyster. The mortified portion of the villous coat that is situated within the red circle is easily removed from the muscular coat, which is commonly found apparently not changed from a state of health. In some instances the central portion of the slough had disappeared, leaving an excavation in the villous coat as if a portion of it had been cut out. Even in these cases the muscular coat was commonly sound. The villous coat was generally unattached at the margin of the excavation, and the finger could often be easily pushed under it from one depression to another. Sometimes, however, the sloughing extended into the muscular coat, and even into the peritoneal coat, which was rendered evident externally by the mulberry-coloured patches. The dark spots on the peritoneal coat are always

much less extensive than the corresponding gangrenous portions of the mucous membrane. While one part of the large intestines has lost its natural tenacity from gangrene, another has sometimes acquired an increased power of resistance, and, when cut into, conveys a semi-cartilaginous feeling to the hand. Sometimes large portions of the villous coat are found sphacelated without any intervening living parts. In these instances it is extensively separated from the muscular coat, and is sometimes found loose in the cavity of the intestine. The gangrenous shreds occasionally stretch across the diameter of the intestine like a bow-string. The separated portions of the villous coat are torn by the slightest force. They resemble in appearance pieces of dirty lint imbued with the ichorous discharge of a gangrenous ulcer.

Sometimes small collections of purulent matter are found between the villous and the muscular coats. This is, however, not a frequent occurrence.

Occasionally dysentery leaves traces of disease in the large intestines of a different kind, namely, tubercular ulceration. Ulcers of this character are not unfrequently found spread over portions of the villous coat, and, for the most part, in a remarkably distinct and uniform manner. That portion of the villous coat which intervenes between the ulcers has, in general, a loose pulpy appearance. Sometimes it is turgid and reddish. Viewed at a little distance, the inner surface of the intestine appears to be sprinkled with a soft curdy-like substance. These cream-coloured specks are of various sizes: sometimes they are not more than a line; at other times they are an inch in diameter. Upon examining a small speck, the whitish substance is found to protrude a little beyond the surface of the intestine, and adhering, but not very firmly, to the villous coat. After removing this substance, a depression or incipient ulceration is exposed. The base and margin of the indentation are generally dark red. The depression eventually increases, and becomes an ulcer; which is always encircled by a red portion of the villous coat. Sometimes the

ulcers resemble the ill-conditioned sores, with prominent edges, which occasionally occur on the inside of the lips, particularly during a severe course of mercury. In general, the base and edges of the ulcers are indurated, unequal, and scabrous. When a section is made across them, a gristly feeling is communicated to the hand. The tubercular appearance of these ulcers is very remarkable. They sometimes resemble warty elevations, with excavated apices, in a state of ulceration. For the most part, ulcers of this kind are oblong: in length they extend from half an inch to an inch; the breadth is seldom above half the length. The longest diameter is always in a transverse direction to the cavity of the intestine.

Such are the more common traces of disease found upon inspecting the bodies of individuals who have died of dysentery, more particularly among Europeans. Death rarely, if ever, occurs among this class of people before a certain degree of gangrene of the villous coat of the large intestines has taken place.

Abscesses and other morbid states of the liver are occasionally concomitants of dysentery. When traces of disease in the liver were discovered on dissection, the circumstance is noted in the Tables of Casualties. The nature of the structural changes of this organ has already been mentioned. Upon examining the bodies of Malays that have died from dysentery, traces of disease of a less active character are discovered. The mesentery and meso-colon are generally found massy and dark-coloured from turgid blood-vessels, and the lymphatic glands greatly enlarged. The coats of the large intestine are thickened and firm; frequently the calibre of the intestine is greatly contracted. The villous coat is, in these cases, unequal, puckered, and covered with a gelatinous muco-purulent substance. Occasionally, however, instances occur where the inner surface of the colon is found sprinkled with grumous spots in a state of mortification, and sometimes the sloughing portions are extensive.

Dysentery among the Caffries, although perhaps less painful than among Europeans, leaves traces of very active disease in the large intestines and meso-colon. The tendency to gangrene of the cæcum and colon is as great among them as it is among Europeans.

When dysentery proves fatal among Indians, portions of the large intestines are, for the most part, found in a state of gangrene.

The following seems to be the progress of the local symptoms of dysentery. During the early stage, it may be presumed that the capillary arteries of the villous coat of the large intestines are in a state of active congestion. This state is evidenced by an increase of the natural mucous secretion, more or less commixed with blood. As the disease advances, fluids are effused into the coats of the intestines, more particularly into the villous coat. The coats of the intestine become thickened, unequal, and the cavity contracted. The villous coat is now covered with a slimy muco-purulent substance; which, mixed with blood, effused from ruptured blood-vessels, forms the discharges passed during a considerable period of the disease. Patches of the villous coat eventually slough. The sloughs are commonly dark-coloured, and have a grumous appearance. The gangrene extends, and death, in some cases, does not take place until large portions of the villous coat, and sometimes of a part of the other coats of the intestine, sphacelate. Under the gangrenous stage of the disease, the evacuations are fluid, brown-coloured, and excessively offensive: they seem to consist chiefly of a thin fetid serum.

The active state of the inflammation of the villous coat in some rare instances, more particularly among the Malays, terminates in a chronic induration of the different coats of the intestine. This appearance, perhaps, arises from the effusion of coagulable lymph. An indurated state of the intestine is often accompanied by a symptom that may, in many cases, be considered as indicative of this kind of morbid structure, namely, the discharge of a whitish mucus, which alternates

with feculent stools. This white muco-purulent discharge resembles pus, and has, I believe, been mistaken for purulent matter. A correct diagnosis of the morbid structure of the large intestines is often attended with much difficulty. The indurated condition of the coats of the intestines is sometimes combined with sloughy patches of the villous coat. Perhaps, in these cases, the tendency to mortification supervened subsequently to the induration of the coats of the intestines. Where the more important change of structure of the intestines is an induration of the coats, life is gradually wasted, not suddenly extinguished as when the villous coat becomes extensively gangrenous.

All classes of troops are liable to dysentery. The Europeans are, however, more subject to it than any of the other races. European women are as obnoxious to this disease as males; so are the children of European parents. It is infinitely more prevalent among the lower ranks of the army than among the higher. No class of society is, however, completely exempted from dysentery. It is less prevalent among the temperate than among those who indulge freely in the use of spirituous liquors. The artificial old age of the drunkard is peculiarly unfavourable to recovery in dysentery.

Upon inspecting the Tables it will appear, that dysentery proves fatal during every month of the year. It occurs, therefore, in all kinds of weather. How far dysentery may be connected with the remote cause of endemic fever, it is difficult to determine. Generally it occurs uncombined with remittent or intermittent fever: sometimes, however, it is complicated with one of these. Occasionally the symptoms of dysentery and fever prevail alternately; sometimes the two diseases appear to exist independently in the individual at the same time.

The same causes which excite fever likewise occasion dysentery. Great fatigue, much exposure to variable weather, numerous privations in regard to food and rest, &c. increase the prevalence of both fever and dysentery, and aggravate their malignity.

The commissioned officers of the army being much less liable to dysentery than the privates, it may be inferred that atmospherical vicissitudes, irregularities in regard to food and drink, &c. contribute greatly to occasion the disease. Soldiers are exposed to considerable variations of temperature while on sentry during night. But, even when off duty, they are frequently inattentive to the means which might protect them from the consequences of mutations of weather. Habits of intoxication tend greatly to occasion dysentery. Independently of the positively bad effects of inebriety on the health, an undue quantity of spirituous liquors has negatively a pernicious influence. The drunkard seldom pays the requisite attention to his food; and, during the periods of intoxication, he is often much exposed to great transitions of temperature. These debilitating circumstances render the system less able to resist the influence of the cause of dysentery, and tend to diminish the benefits which might be expected from medical treatment.

Dysentery, in tropical climates, has been imputed to morbid bile, consequent to a disordered condition of the functions of the liver. There can be no doubt that the functions of particular organs may be impaired or disordered from the morbid action of vessels, unaccompanied by any remarkable deviation from the natural structure. But to what extent do the secretions, from organs whose functions are disordered, operate as a cause of disease in the same subject? Diseases of disordered functions merely, do not admit of elucidation by anatomical investigation. They can neither be proved nor disproved by post mortem examinations. Where morbid structure is not apparent in an organ, the inference that disease owes its origin to impeded functions must be occasionally very hypothetical. In many fatal cases of dysentery, no structural derangement can be discovered in the liver.

Has the morbid or vitiated bile, which is said to occasion dysentery, any peculiar appearance by which it can be distinguished from bile of an inoffensive or healthy quality? The

bile which is found in the gall-bladder varies greatly in colour and consistence. It is sometimes whey-coloured and watery, passing into yellow, and viscid, thence to black, and of a pitchy consistence. These different states of the bile appear to depend upon causes with which we are frequently unacquainted. They occur under very different conditions of the liver, as also under great varieties of disease. The sense of taste affords no satisfactory evidence regarding the vitiation of bile. Bile, of any colour and consistence, I never found to taste either acrid or acid. Black bile becomes yellow by dilution with water: hence the blackness of bile appears to arise from a concentration of the ordinary colour of the secretion. The mere darkness of the tinge of bile does not therefore seem to be an indubitable proof that it is of an offensive quality. Thick black bile, diluted with vinegar, forms a dark-green substance, resembling chopped spinage. Alvine evacuations similar to this substance, are sometimes passed, which is probably occasioned by a combination of acid and black bile in the common track of the intestines. I have seen considerable quantities of black pitchy bile passed by stool, seemingly unmixed with any other substance. The stools had no particular smell, and in every respect resembled the thick black bile as it is frequently found in the gall-bladder. Had there been much acidulous fluid in the intestinal canal, I presume, the evacuations would have been greenish.

If bile be possessed of qualities so acrid and pernicious as to occasion inflammation of the large intestines, how comes it that the small intestines so generally escape its hurtful influence?

As morbid states of the liver occur independently of dysentery, and dysentery uncombined with diseased liver, may we not suppose that the operation of the same remote and exciting causes which produce morbid affections of the liver, may likewise occasion inflammation of the villous coat of the intestines? However frequently inflammation of the large intestines is found combined with induration or abscess of the

liver, it is difficult to conceive that the former disease can be related to the latter as cause and effect.

In regard to prognosis in tropical dysentery, the following may be considered as unfavourable indications of recovery: long residence in a tropical country; advanced life; the patient having previously suffered from the disease, and recently undergone much fatigue; habits of inebriety; great debility; emaciation; dejected countenance; partial clammy sweats; quick small pulse; urgent thirst; tongue furred; nausea; vomiting; hiccup; very frequent dejections, with distressing tenesmus; violent pain, or a complete cessation of pain; brownish watery offensive dejections; involuntary evacuations, and an absence of suffering.

The primary symptoms of dysentery may be presumed to be decidedly inflammatory. The first indication of cure, in the early stage of the disease, is therefore to reduce the force of the circulation. Large and repeated blood-letting is frequently advisable; and when there is much vascular excitement, the advantages are generally well marked. Sometimes the favourable results are permanent: frequently, however, the best-directed attempts to subdue inflammation of the large intestines by venesection, are futile, or attended by only temporary efficacy. The influence of blood-letting over inflammation of the mucous coat of the intestines is often very feeble. The extent to which blood-letting may be carried is often a point of much difficulty. When carried very far, the arterial action may be so much reduced as to diminish the principle of renovation in the system, and by that means the convalescence may be protracted, if it should not lessen the chance of recovery. Passive congestion, accompanied by sloughing, follows inflammation of the villous coat so rapidly, that it becomes a business of great nicety, in some stages of the disease, to say when bleeding should be adopted. The period between the time when venesection might be useful and that where it would in all probability be of no advantage, perhaps hurtful, is often very short. The progress of the disease is frequently

extremely insidious. Instances occasionally occur where unthinking soldiers perform their duty while suffering under the primary symptoms of dysentery, and do not apply for relief until the disease has reached that stage when the intestines are fast tending towards a state of mortification. The local progress of the disease is sometimes very rapid. Examples have occurred where soldiers continued to do their duty until six or eight days before death. As usual in this disease, the villous coat of the large intestines was found gangrenous in these cases.

Severe pain is often an uncertain indication of bleeding, particularly in the advanced stages of the disease. Sometimes there is a considerable degree of uneasiness felt in the abdomen after mortification of a portion of the villous coat has taken place. Perhaps this may arise from an extension of inflammatory action into the muscular and peritoneal coats. The progress of inflammation in the muscular and peritoneal coats appears to be much less rapid than in the villous. On this account there may be morbid action going on in these coats, giving rise to pain and uneasiness, after the villous coat has sloughed. When sloughing of the villous coat of the intestines has once taken place to any remarkable extent, I am very doubtful whether a cure is ever effected, either by the uninterrupted operations of the restorative powers of the constitution, or by the assistance of art.

The state of the pulse should be particularly attended to. When it is full and strong, bleeding is almost invariably indicated. A feeble quick pulse should excite a suspicion that the villous coat is not then actively inflamed, and that bloodletting might be detrimental.

Much may occasionally be learned, regarding the progress of the disease and the morbid condition of the intestines, by regularly and carefully inspecting the dejections. During the stage of active excitement, the evacuations consist chiefly of mucus, mixed or streaked with blood; occasionally, however, alternating with fluid feculent matter. Passive congestion

succeeds, in which the secretion of mucus is less copious: then follows sloughing of the villous coat, when the discharges consist almost entirely of a chocolate-coloured fluid. The healthy contents of the small intestines are now seldom observed. Upon passing into the large intestines, the soft fecal matter is mixed with the ichorous sanies which effuses from the mortifying villous coat, and forms the offensive discharges already described.

Mild purgatives are useful, particularly during the early stage of the disease. They co-operate with venesection in reducing arterial action, while they remove the feculent contents of the primæ viæ, and the morbid effusions which flow into the cavity of the large intestine from the inflamed or mortifying surface of the mucous membrane. The purgatives should be always of a very mild quality, and they ought not to be repeated too often.

As auxiliary means of cure, fomentations to the belly, the warm bath, sometimes a succession of blisters, opiates, emollient or astringent injections, are occasionally useful.

In cases where, after vascular commotion has subsided without being followed by symptoms indicative of sloughing of the intestines; where the disease has been protracted and the symptoms appear to be occasioned by an excessive effusion of coagulable lymph, giving rise to thickening and induration of organs; the exhibition of mercury, so as to excite ptyalism, may be tried. Under the most favourable circumstances, intertropical dysentery is often an extremely ungovernable disease. Should the person affected come early under medical treatment, the progress of the symptoms may be occasionally arrested; but if, from whatever cause, the application of medical means is delayed until sloughing commences, which often follows suddenly after the supervention of the primary appearances, I am not aware of any mode of treatment which promises to have much influence in averting a fatal termination of the disease. The principle of restoration seems to be very ineffectual when much disease takes place in the villous

coat. All we can then do is to sooth morbid feelings, and to endeavour to render the passage to the grave less painful, by the exhibition of alleviating remedies.

The following case will illustrate the leading symptoms of the disease, and the mode of treatment recommended. It was drawn up by Assistant Staff-surgeon Nicholson, who attended the subject of it. Mr. Nicholson is an intelligent and zealous medical officer. He has had much experience in the treatment of dysentery, in this country: I subjoin the case in his own words.

Case of John Marr, *45th Regiment, Æt.* 29.

Of a strong and robust habit, and has generally enjoyed good health; has been two months on the island. Admitted into hospital on the 18th April; said he had been four days affected with purging, attended with pain in the abdomen; stools bloody; symptoms daily became worse; on admission was in a state of pyrexia; pulse quick and full; tongue foul. Was bled to the extent of ℔ iiij, and had a dose of ol. ricini; diet low. On the following morning, complained of an acute pain in the hypogastric region; passed a restless night; urgent pyrexia; stools yellow; tongue white and pasty; pulse quick and full. Venesection repeated, to the extent of ℔ ij, and a dose of ol. ricini administered; towards evening the pain in the abdomen had considerably increased in violence; augmented on pressure by the slightest touch, throwing the abdominal muscles into action. Had several mucous stools through the day: venesection repeated to ℔ ij, and a blister applied to the belly. On the 20th, appeared better; pain abated; slight pyrexia; stools frequent; pulse quick and small; tongue pasty: castor oil repeated throughout this day; was much purged; stools muco-purulent. Pulv. ipecac. comp. gr. xv, h. s. sumend.: during the next day appeared much improved; treatment continued the same as the day before. On the morning of the 22d, was suddenly attacked with a violent and acute pain above the pubis; in-

creased by compression; respiration considerably impeded; pulse quick; was bled to the extent of ℔ ij; towards evening the pain was much abated; had several watery stools through the day; pulse very quick; great restlessness; pulv. ipecac. comp. repeated at bed-time. 23d, Passed a restless and uneasy night; had several watery stools; throughout the whole of this day suffered much from the pain in the abdomen, the seat of which he referred chiefly to the hypogastric region. From this date the most prominent symptoms were frequent watery dejections; was scarcely ever free from pain and tenderness of the abdomen, particularly at the lower part. Very great restlessness and anxiety; pulse quick and small; towards evening had an accession of fever, which continued through the night. The treatment consisted in the exhibition of the pulv. ipecac. comp. in doses of x gr. three times a-day, with an occasional dose of ol. ricini; the abdomen was again blistered. On the 2d May he had become quite exhausted; stools passed involuntarily. Expired the following morning.

Dissection Report.

Cranium.—Cerebrum and its meninges apparently natural: ʒj of fluid in each lateral ventricle.

Thorax.—Viscera natural: ʒfs of liquor pericardii.

Abdomen.—Omentum inflamed; increased vascularity of the peritoneum and of the bladder; peritoneal coat of the liver inflamed. In the right lobe of the liver, and towards its posterior edge, an abscess was found, containing ℔ j of thick purulent matter: remaining structure of the organ apparently sound: ʒj of viscid bile in the gall-bladder; increased vascularity of the mesentery and meso-colon; stomach natural; small intestines inflamed; large intestines thickened; mucous membrane considerably thickened and tuberculated; the surface of the tubercles ulcerated and sloughy; remaining viscera natural.

Liver weighed 3 ℔ 10 ʒ, not including the pus: spleen, 12 ʒ.

N. B. Body examined four hours after death.

The exhibition of mercury, so as to produce ptyalism, has not been much practised by the medical officers in the interior, for the cure of dysentery. They have, however, in general, given this plan of cure a trial. Dr. Paterson, Assistant-surgeon, 45th regiment, has much confidence in the liberal use of mercury, combined with copious venesection. He has had considerable experience in the treatment of Europeans under dysentery; and, as he is an intelligent and attentive medical officer, his sentiments demand our regard.

In all cases of dysentery, which come early under his care, with much vascular commotion, he bleeds freely. Five or six pounds are sometimes taken from the arm in the course of two or three days. He thinks himself warranted in repeating venesection until the blood drawn has no buffy coat, the pain be much relieved, and the blood passed by stool greatly diminished. He gives occasional purgatives, such as small doses of neutral salts, during the course of the disease. With respect to the exhibition of mercury, the following are his views: "In the cure of dysentery," he says, "my object is "to bring the system under the influence of mercury as "speedily as possible; and, with this view, a scruple of calo-"mel is given morning and evening, having previously pre-"scribed a laxative. The calomel seldom produces any in-"convenience. In some cases, however, it is necessary, now "and then, to interpose a dose of castor oil, or of some neutral "salt, from its producing a degree of uneasiness in the "bowels, and sometimes an increase of the tenesmus. After "three or four doses of the calomel, the mouth becomes sore "with ptyalism; and from this event, the disease uniformly "yields. The cases of relapse, or long standing, however, "receive no benefit from the mercury, as the mouth never "can be properly affected. Instead of ptyalism, the mouth "becomes hot and dry, with considerable irritation of the "constitution, and, I think, a hurtful influence on the "disease. From the insusceptibility of the system to the "salivatory influence of mercury, I am induced to believe,

" that the disease has already produced such derangement of " the structure of the intestines, as to render it doubtful if " any medical treatment whatever could effect a cure; and " from this event alone I generally pronounce an unfavour- " able prognosis.

" I am far from pretending to say that mercury given in " this way will uniformly cure dysentery; but in giving it a " preference in the disease, as it appears in Kandy, I think " I am warranted by its success in the hospital under my " charge.

" Sudorifics, opium, baths, blisters, astringents, and ene- " mata: with respect to these medicines, as means of cure, I " possess little confidence. In most cases, however, I have " recourse to them, from the temporary relief which they " afford. The subjoined return will show the result of my " practice in dysentery for nearly eight months, in Kandy, " namely, from the 3d April to the 13th November 1820. A " few of the cases, included in the return, had previously suf- " fered under dysentery at Trincomale. Most of the cases " were, however, primary attacks of the disease.

Admitted.	Discharged.	Died.	Remaining.
" 70	57	7	6 "

This return shows a less ratio of mortality than usually occurs among Europeans attacked with dysentery in the interior of Ceylon. How far this circumstance may have been occasioned by the free exhibition of mercury, further experience must decide. It is proper to remark, that Dr. Paterson's patients were chiefly young men, who had only lately arrived in a tropical climate, and who had not suffered from the privations and laborious duties to which the other corps in the island had been greatly liable. In sound constitutions of this kind, copious venesection would of itself have a powerful effect in arresting the progress of dysentery, if adopted early in the disease.

CHAPTER V.

Tetanus.

THREE fatal cases of Tetanus appear on the returns. Two were Europeans, the third was a Malay.

Martin M'Lean, 73d regiment, was wounded in the field by a musket-ball. The ball injured the integuments and muscles of one of his legs, but did not touch the bones. Tetanic symptoms appeared shortly after, namely, on the 22d February 1818. Copious and repeated bleeding was tried without avail; then large doses of opium, which were equally unsuccessful. He died on the 24th.

On inspecting the body after death, the muscular parts were found much redder than natural: the intestines had a red colour, seemingly from a general suffusion of the blood-vessels. The other viscera appeared sound.

Timothy Hays, private 83d regiment, was admitted into hospital, Kandy, from the field, on the 24th May 1818, in consequence of a gun-shot wound of the right fore-arm. The ball had fractured both the radius and ulna. On the 28th he complained of uneasiness and stiffness of the muscles of the jaw and back of the neck. 29th. Morning, the jaw was locked, and he had occasionally severe general spasms. With the hope of averting the common fate of those who suffer under tetanus, it was determined to amputate the arm above the elbow. The operation was performed about noon: no relief followed. Enemas, composed of the infusion of tobacco, were then had recourse to, but without any advantage. Death relieved him from his agonizing sufferings about mid-day on the 30th.

Upon inspection of the body after death, no remarkable structural derangement was observed in any of the cavities of

the body, nor in the parts contiguous to the fauces. The muscular parts had a natural colour.

Cader, a Malay, received two gun-shot wounds on the 18th February. A ball entered the left arm on the back of the ulna, near to the junction of that bone with the carpal bones. The ball made its exit near to the pisiform bone. Both the ulna and radius were injured, although neither of them was completely fractured. The substance which inflicted the other wound entered above the nipple of the left breast, and lodged under the pectoral muscle of the right side. In its passage it had fractured the sternum. On the 19th the extraneous body which lodged under the pectoral muscle was cut out, and proved to be a portion of an iron rod, nearly an inch long.

The wounds continued to look well until the evening of the 27th, when he complained of stiffness and pain in the back of his neck. The wounds on the arm were then observed to be paler than usual. An anodyne draught was exhibited.

Next morning (28th February) uneasiness of the back of the neck continued. Complains of a sense of uneasiness about the root of the tongue, and stiffness of the muscles of the jaw; deglutition difficult; has occasionally profuse perspirations about his head and neck.

Several buckets-full of cold water were poured over his body; this operation was immediately followed by an abatement of the tetanic symptoms. He can now open his mouth freely; he can likewise move his head without pain, although there is still a little stiffness. The spasms returned in the afternoon; the aspersion of cold water was then repeated, but without any advantage. Two hours after the cold water had been thrown over him, an enema (consisting of four ounces of an infusion of ʒij of tobacco in ℥viij of water) was exhibited. The injection was instantly returned along with a lumbricus. A slight alleviation of the violence of the spasms followed, to-

gether with a reduction of the strength of the pulse, and considerable general debility.

The enema was repeated at six and at eight o'clock.

Nine P. M. Pain and stiffness of the neck considerably diminished since the exhibition of the injections. Opens his mouth without much difficulty; greatly exhausted; seems disposed to sleep.

March 1st. Two stools during the night; has not much uneasiness about the neck and fauces; wound on the thorax florid and healthy, that on the fore-arm is pale and gleety.

To have the injection repeated every two hours.

Eight o'clock, evening. Has been all day under the exhausting influence of the tobacco; spasms are now more frequent and more severe; has profuse cold sweats; quite unable to swallow liquids; much froth about the mouth; bowels free.

Had an anodyne draught. The exhibition of the enema was omitted during night.

March 2d. Passed a restless night, on account of the frequency of the spasms.

The tobacco enema was repeated. This injection produced vomiting, syncope, cold clammy sweats, and feeble pulse. The extremities soon became cold, and a violent paroxysm of spasms followed; complained, for the first time, of a pain extending from the xiphoid cartilage to the back. The disease now assumed the shape of opisthotonos.

The aspersion of cold water was again tried, which was followed by a severe paroxysm of the general spasms. He was then ordered five grains of opium every third hour; finds much difficulty in swallowing it. Twelve o'clock. Had a blister applied to the back of the neck, as also one to the scrobiculus cordis. Since he commenced the opium, the paroxysms have been less violent. The pulse has risen from sixty to ninety pulsations in a minute.

March 3d. The opium was exhibited regularly during the night. Blister rose well. Had a restless night; paroxysms of the spasmodic contractions continue violent and frequent.

Wound on the thorax discharging a thin serous fluid. Pulse extremely rapid, sharp, and small; evidently sinking.

The opium to be continued.

One o'clock. The spasms of the muscles of the jaw suddenly relaxed; he opened his mouth twice, and, after shutting it, immediately expired.

Appearances on Dissection.

The muscles were unusually dark coloured.

Brain.—A small quantity of serum was found between the membranes and at the base of the brain.

Thorax.—The sternum was found completely torn across by the piece of iron. The mediastinum had suffered little injury. Some fluid blood was found in the auricles and ventricles of the heart.

Abdomen.—Small intestines suffused with blood; contained hardened fecal matter. When a section was made of the liver, a large quantity of blood flowed from it.

I am aware that the above cases possess little novelty. The case of Hays has some interest on account of the failure of the powerful means which were employed to subdue the disease, namely, removal of the wounded part, and the exhibition of enemas of the infusion of tobacco. In the third case, the extremely relaxing influence of tobacco had no permanent effect in abating the violence of the spasm, although this means of cure had a fair trial.

CHAPTER VI.

Epidemic Cholera.

EPIDEMIC cholera first appeared among the troops in the Kandyan provinces in the month of February 1819. This inscrutable disease had been making great ravages among all classes of people in the peninsula of India since 1817.

Cholera appeared at Jafna in December 1818. Early in January 1819 its influence was felt at Manaar. I am not aware that the inhabitants of the intervening villages suffered by it. About the 26th or 27th of January the disease appeared at Colombo, and the first case which occurred among the troops in the Kandyan provinces happened at Kandy on the 25th February. Between this date and the 4th May it appeared at fourteen other stations. The military stations in the province of Saffragon escaped its influence, as did also some small posts immediately depending upon Kandy.

The remote cause of this disease is remarkably obscure. We are completely ignorant of the phenomena which originate the disease or that tend to its propagation. The causes which restrain its progression among the inhabitants of a country are equally unknown to us. In this state of uncertainty regarding the origin of cholera, it is of the first importance to state facts in an unbiassed manner, and to abstain from deducing inferences until a greater number be collected.

It is impossible to reconcile the appearance of cholera at the different posts of the interior by infection, or the direct communication of one individual with another. In no instance did it prevail among people residing in the same house or barrack, so as to excite a belief that the contact of the sick with the healthy contributed to its propagation. The disease occurred at distant intervals of space. Sometimes it passed over

several posts upon a line of communication, and then reappeared with as much violence as ever. It likewise appeared at distant intervals of time. In several of the garrison a lapse of eight, ten, or fifteen days occasionally occurred between the termination of one case of the disease and the appearance of another.

Commissioned officers were exempted from its influence: it did not, however, exclusively affect a particular class of people: unlike the cause of endemic fever, it attacked Caffries as generally, and, perhaps, more severely, than any other species of troops. In the garrison of Kandy, the Indians suffered much by it. The constitution and moral habits of this class may have contributed to predispose them to the disease. In general these people live abstemiously, and they are but little careful to avoid exposure to variation of temperature. Cholera did not, however, generally prevail among the troops in proportion to the degree of exposure, to alternations of weather to which they were liable, or to the privations under which they suffered. Europeans, and other classes of people who enjoyed the means of living comfortably, and who seemed to have a sufficient degree of prudence to induce them to consult their own welfare, fell under the influence of the disease, as well as the comparatively naked, abstemious, and improvident Indian.

Women and children were not entirely exempted from attacks of cholera, although a less proportion of them seemed to come under its influence than in males and adults.

The propagation of cholera did not appear to be in any degree affected by changes of weather, or by considerable transitions of temperature. The disease first appeared in the island on the humid and sultry flats near to the sea: it extended with unabated violence to the elevated terrace of the interior, where the air is comparatively dry, and the temperature low. It prevailed with as much severity while torrents of rain were falling, as it did when the air was dry, hot, and parching. Hence every endeavour to trace a connexion be-

tween the disease and an obvious condition of the atmosphere, became completely futile.

As it frequently affected a few individuals among considerable numbers similarly situated, it may be inferred, that there were some concurring conditions of the constitution, which influenced the supervention of the disease. The nature, however, of that aptitude of the constitution which may have disposed or concurred towards the existence of the disease, was quite inexplicable.

Cholera, in general, invaded suddenly, and without any well-marked previous indisposition. Sometimes, however, a short period of imperfect health preceded a full development of the leading symptoms of the complaint. For the most part the symptoms which first arrested the attention of the patient were vomiting and purging. Neither of these symptoms was violent; the fluid thrown up by vomiting was almost always watery and colourless. The stools consisted of an opaque milky fluid, resembling congee (the water in which rice has been boiled). Sometimes it was limpid like pure water. The primary symptoms seemed to supervene more frequently between the hours of two and five in the morning, than during any other period of the day. The vomiting and purging were always accompanied by a general sense of weakness, and particularly by great feebleness of the powers of locomotion. In some instances the patient complained of headach, although the symptoms seemed rarely to be severe; great thirst was a leading symptom of the complaint. As the disease advanced, the countenance became collapsed, and the eyes sunk: the action of the heart and arteries was weak, and the pulsations were quicker than natural. During the early stage of the disease, the skin was cold and dry; subsequently it was covered with a cold clammy sweat. The nails of the fingers and toes became livid, and the skin of the hands shrivelled. The breath was cold: under the tongue the mercury in the thermometer has been observed to sink as low as 94°. The tongue was often clean, sometimes it was white,

and in a few cases it was covered with a white thick fur like cream. In a great proportion of cases the senses soon lost their ordinary acuteness, particularly the sense of hearing. Eventually the voice became comparatively indistinct. Respiration was frequently hurried and anxious, and sometimes there was a feeling of great discomfort about the scrobiculus cordis.

In a number of cases the disease had made considerable progress before they were admitted into hospital. Under circumstances of this kind the patient seldom made much complaint, although the awful progress of the disease was often strongly marked. This was evidenced by great prostration of strength, a collapsed ghastly countenance, cold clammy skin, and weak thready pulse. Sometimes the pulsations of the arteries were scarcely perceptible even when the patient was walking about. In general these cases stated that they had vomited a few times, and that they had passed some watery stools. Frequently, however, neither vomiting nor purging was present after admission into hospital.

In the advanced stage of the disease the eyes were dull and inexpressive: sometimes they were suffused with tears. The skin was not only clammy and cold, but in many cases it was soft, and felt more like a wet hide, than an animated substance.

Some of those affected complained of a sense of extreme hunger, and earnestly begged for something to eat. These cases hurriedly devoured a portion of the food which was brought to them. One man died while in the act of swallowing a morsel of bread which he had chewed.

As death approached, many of the patients evinced much uneasiness and anxiety by frequently changing their posture, and tossing their limbs about in bed. Often they could not assign a particular spot where the cause of their distress seemed to originate: sometimes they referred the source of their uneasiness to the epigastric region.

The feeble remains of vitality soon disappeared. Many

retained their intellectual powers little impaired to the last. Some died immediately after stating that they felt better. Coma, or a state of insensibility resembling it, supervened in a few cases before death.

Some instances occurred where the disease terminated fatally during the second hour of the attack. In a few rare instances the patient lingered for four or five days, and then expired. When the progress of the disease was long protracted, the stools became brownish, and they assumed a little more consistence than they had at first.

A few of the cases complained of spasms of the muscles of the extremities. The spasms were, however, rarely severe. Cramps, or involuntary contractions of the muscles, were never prominent symptoms of the disease, as it appeared in Kandy. In some other stations spasms were frequent and severe.

The above is a brief description of this destructive and intractable disease, as it appeared among the troops in the garrison of Kandy. In this, as in all other diseases, there are different gradations of violence; it is, therefore, difficult to embrace, in a general description, the various shades and forms cholera assumed. In some patients the symptoms were from the beginning comparatively mild, and did not make a rapid progress. Medicine had a very beneficial influence in a number of these cases: sometimes, indeed, the symptoms yielded quickly to the means of cure which were adopted. Other cases occurred where severe symptoms supervened quickly, followed by a progressive and rapid aggravation of the disease. Patients of this description seldom received much benefit from the exhibition of medicine. In the latter class of cases there was an evident enfeeblement of the constitution from the beginning, without being succeeded by a reaction of the powers of life. Some instances occurred where the vital energies became suddenly obstructed, indeed almost extinguished. Every endeavour to avert a fatal termination of the disease was, in such cases, generally unavailing. One man, a Caffrie serjeant, I saw in apparent good health at half past six, P. M.

At half past seven o'clock the same evening he was suddenly seized with an uneasy sensation in his bowels, which was followed by a single fluid evacuation; and once or twice he belched up some watery fluid from his stomach. A scruple of calomel, with a stimulating draught, were instantly exhibited, and in about fifteen minutes he was put into a warm bath. While in the bath a vein was opened; very little blood, however, flowed. The means of cure adopted produced no melioration of the disease. Fatal symptoms soon supervened. He expired at a quarter past nine o'clock. In this case the disease ran its course in about an hour and three quarters, notwithstanding a careful and prompt exhibition of seemingly powerful means of cure.

The European constitution did not yield so rapidly to the enfeebling influence of the disease as that of Caffries, Malays, and Indians. Among Europeans cholera was attended with more pain and uneasiness, particularly in a distressing sense of heat and discomfort about the scrobiculus cordis, than among the other classes of troops.

European patients were sometimes admitted into hospital before the energies of the constitution were extinguished, and while the action of the vascular system was still tolerably good. The circumstance rarely happened among the other classes. The force of the vascular system seemed soon to become greatly diminished among the Caffries, Malays, and Indians, when they were attacked with cholera. As the extremely aggravated symptoms did not in general come on so rapidly among the Europeans as among the blacks, more time was allowed to try the influence of medical treatment.

Few cases of relapse occurred.

In two instances convulsions supervened after apparent death. One body had been removed to the dead room before the muscular contractions came on. In both cases the head was observed to move in a shaking paralytic manner; the toes were slowly extended, and again bent inwards; the lower extremities moved upon the pelvis with a rotatory motion sup-

ported upon the heel; the hands moved; pronation and supination followed each other frequently; the fingers were extended, and again rigidly bent inwards. These contractions continued in one of the cases about twenty minutes, in the other they lasted nearly three quarters of an hour. Neither of these men had spasms during the progress of the disease. When the convulsions appeared, frictions and other means for rousing the system were long and carefully applied, but without success.

Appearances on Dissection.

In cases that terminated rapidly the blood-vessels of the membranes of the brain were generally found unusually tinged. The dura mater presented a greater number of bloody points than is commonly observed. The increased turgidity of the blood-vessels of the pia mater was still more remarkable than in the dura mater. When the former membrane was removed from the convolutions of the brain, it appeared at a little distance like a coagulum of blood. The plexus choroides and velum interpositum were likewise unusually vascular. In protracted cases no very unusual turgescence of the blood-vessels was observable.

Thorax.—The lungs were frequently found gorged with blood. The right side of the heart and the venous trunks were often unusually filled with blood: sometimes the heart was more flaccid than natural.

Abdomen.—When cases ran a rapid course, the intestines, viewed in situ, appeared remarkably white and bloodless. In protracted cases they were frequently reddish. The villous coat was often particularly vascular. Some cases occurred where the vascularity was so great as to resemble a successful injection of the intestines with fine size coloured reddish brown. There was, however, no thickening of the coats of the intestines.

The stomach and intestines generally contained more or less of a turbid watery congee-like substance. Sometimes

flakes of a tenacious mucus were found floating in the fluid. The villous coat was for the most part covered with a thick layer of adhesive mucus.

Liver.—This organ did not present any morbid appearance.

The gall-bladder always contained more or less bile. In quality this secretion was found possessing all the different shades of colour and consistency, between pale and watery to black and pitchy.

Treatment.

In a great many cases it seemed evident that the nervous and vascular system suffered under some powerful and deleterious influence, even from the earliest appearance of the disease. The pathology of cholera being so very obscure, it was often a point of great difficulty to decide upon the means of cure. The more evident indications were, to rouse the vital energies by endeavouring to restore the strength of the circulation, and to recall heat to the system. For this purpose draughts composed of various stimulants, such as ether, ammonia, peppermint water, tincture of opium, spirits, &c. were exhibited, and repeated, according to the urgency of the symptoms. In a number of cases calomel in scruple doses was given, and in some this quantity was repeated every second hour.

In order to recall heat to the system, the warm bath was frequently tried. The bath generally produced a slight improvement of the action of the vascular system. The improvement was, however, often of very short continuance. In general the patients complained of much increased uneasiness while in the bath. Even when the temperature of the bath was not above that of the human body in its natural state, it in some instances occasioned much distress. I well recollect being present when a patient under cholera was put into a warm bath. He endured the uneasy sensations occasioned by it for some minutes. At last he started on his feet with a

sudden and almost convulsive impulse, and endeavoured to escape from the bathing-tub. His countenance was, at the same time, expressive of the greatest agony. In some instances the warm bath tended to reduce the strength, and by that means it sometimes appeared rather to hasten a fatal termination of the disease, than to contribute to recovery. The warm bath was, therefore, less frequently used towards the decline of the prevalence of cholera, than it had been when the disease first appeared. The patients were generally wrapped in blankets: sometimes pans filled with hot embers were placed under the couch. Tin bottles filled with hot water were applied to the sides and feet. The latter mode of applying heat to the body was found to be very convenient. Enemas of warm congee were sometimes exhibited.

With the view of stimulating the extreme vessels of the skin, frictions of the body with oil of turpentine were frequently had recourse to.

The appearances on dissection, in many cases, seemed to indicate that there was an undue accumulation of blood in certain portions of the vascular system, more particularly in the large blood-vessels. For the purpose of assisting to equalize the circulation, it was, in some cases, deemed advisable to open a vein*. The abstraction of blood appeared to be useful in a number of those cases which were admitted into hospital before the action of the heart and arteries was greatly impaired. Cases of this kind were, however, almost exclusively confined to the Europeans. Among the blacks, venesection rarely appeared to be useful. No advantage was gained by bleeding in any class of patients when the skin had become cold and clammy, and the pulse weak. Under these circumstances it was, in general, difficult to extract blood in

* The practice of blood-letting in cholera was, I believe, first adopted by Dr. Johnson, and recommended by him in his valuable work on Tropical Diseases.

any quantity; but even when the operation was successful, the consequences very rarely tended to recommend the practice.

A careful and persevering use of these means was in several cases evidently beneficial. Sometimes the good effects were soon apparent. In many of the cases it was impossible to say to what part of the means of cure we ought to attribute the improvement. Numerous cases, however, occurred, where medical treatment produced no abatement of the symptoms. The stomach seemed frequently to be insensible to stimulants, and the body impervious to heat. Without sensibility of the vital organs, no advantage can be expected from the exhibition of medicine.

An improvement of the strength of the circulation, and an increased warmth of the skin, were the primary evidences of an abatement of the disease. Progressive recovery was marked by the breaking out of a gentle perspiration on the forehead, and a tendency to sleep. The appearance of bile in the stools was a very favourable sign of amendment. When this occurred, a more confident expectation of recovery was entertained, than from almost any other circumstance. Cathartics were always exhibited when a melioration of the symptoms took place. In some mild cases purgatives alone seemed to check the progress of the disease. The sensations of the patients themselves could seldom be depended upon as affording much evidence regarding the severity of the disease, or its probable termination. A number of the unhappy victims asserted to the last that they were getting better, and that they had no particular uneasiness.

The exhibition of medicine seemed in a few cases to check the progress of the disease, although it ultimately failed in producing a cure. These cases were sometimes protracted to the third or fourth day. In protracted cases the trunk generally regained a certain degree of heat. The extremities, however, continued cold.

Such is a brief outline of the means which were adopted for the cure of this intractable disease. We cannot boast of

the success of our exertions. Nothing, however, could exceed the care and attention which were paid to the treatment of the patients under this disease by the medical officers who had the particular charge of them *.

I have stated that cholera appeared in the Kandyan provinces in the month of February 1819. It prevailed, more or less, in some of the stations, until the end of June of the same year, and about that period disappeared.

The following Table exhibits the number of cases of cholera admitted on the hospital books, Kandy, among the four classes of troops, to the 20th June 1819, as also the number of deaths and discharges, together with the number of bodies which were inspected.

	Europeans.	Caffries.	Malays.	Indians.	Total.
Admitted	22	12	5	51	90
Died	7	9	3	31	50
Discharged	15	3	2	20	40
Number of Bodies inspected	7	7	3	27	44

I have likewise subjoined a statement of the number of cases of cholera which were admitted on the books of the hospitals at Badula and Allipoot, to the 20th June, together with the number of deaths.

* My worthy friend Mr. Finlayson, now Assistant-surgeon to the 8th Light Dragoons, was particularly solicitous regarding the welfare of his patients. He had the immediate charge of the greater number of the cases of cholera that occurred among the troops stationed in Kandy, and the posts which depended upon that garrison. For the purpose of investigating the origin of this obscure disease, he paid unremitting attention to the symptoms, and with uncommon care and patience examined the bodies of those who became its victims. Hitherto, however, the remote and immediate causes of cholera have eluded our comprehension, notwithstanding the zeal and abilities which have been employed to remove the veil which conceals them. Nature has endowed Mr. Finlayson with strong intellectual powers, which have been cultivated with care and judgment. His attainments are, therefore, of the highest order.

		Europeans.	Caffries.	Malays.	Indians.	Total.
Badula.	Admitted	18	23	3	5	49
	Died	9	9	3	3	24
Allipoot.	Admitted	4	8	2	7	21
	Died	2	7	1	4	14

I am not aware of a single case of cholera which recovered without the use of medicine. In a small dependant post situate about seven miles from an hospital station, six cases of the disease occurred. They all died. Three died on the road to the hospital, and the other three expired almost immediately after reaching it. As far as this fact extends, it evinces that the unaided powers of the constitution were but little able to resist the destructive influence of the disease.

The following brief abstract of the history of a case of cholera will show how rapidly life was extinguished, in some instances, as also how little good was occasionally effected by medicine. The abstract was drawn up by Assistant Staff-surgeon Nicholson, under whose immediate care the treatment was conducted.

Charles Jarvis, 73d regiment, aged 28, admitted into hospital on the morning of the 26th March 1819, at seven o'clock; said that he went to bed the night before in good heath, that he was attacked about four o'clock with vomiting and purging, attended with great thirst, afterwards with spasms in the calves of the legs, and coldness of the feet. On admission, the pulse was scarcely perceptible. Countenance dejected, body cold, and covered with a clammy sweat; had one copious watery stool after his admission, returned to bed without assistance, became very restless, and continued tossing from one side to the other; painful spasms in the calves of the legs; excessive thirst: in the course of half an hour the pulse was totally imperceptible. With the exception of an abatement in the violence of the spasms, he continued in that state until twelve o'clock, when he expired.

The treatment in this case consisted in the exhibition of

draughts composed of ether and tinct. opii, the greater part of which was rejected. Had a hot bath at eight o'clock; while in it, the pulse became more evident; but shortly after being taken out, they were again lost. Stimulant clysters, in which the spiritus terebinth. was the principal ingredient, were tried.

Dissection Report.

Cranium.—Increased vascularity of the dura and pia mater. Substance of the cerebrum and cerebellum apparently natural.

Thorax.—Lungs healthy; heart rigid, as if under the influence of spasm; blood-vessels natural.

Abdomen.—Mucous membrane of the stomach of a red colour; intestines void of fecal matter, but in which was contained, throughout their whole track, a semi-transparent viscid mucus.

Liver healthy; bile in the gall-bladder healthy, and in the usual quantity; remaining viscera healthy.

It is almost unnecessary to observe that the term Epidemic Cholera is a very unappropriate name for this disease.

CHAPTER VII.

Beriberi.

The disease described by Dr. Christie under this name has not affected many of the troops employed in the Kandyan provinces since the country was last occupied by a British force. This will appear upon an examination of the returns. Beriberi was very prevalent among all classes of troops at Trincomale about the beginning of the present century. The Madras native infantry stationed at Colombo suffered much by it about the same time. Beriberi was likewise very prevalent

among the troops employed in the Kandyan country in the year 1803. Since that period the disease has been comparatively but little known in Ceylon. A few cases have occasionally occurred at Trincomale. The number has, however, not been great. Having been chiefly employed on the western side of the island, or in the Kandyan country, my opportunities of seeing cases of beriberi have been very limited.

It is worthy of remark that no case of beriberi appears on the hospital returns of European sick in Kandy and Badula during the year 1818. Dr. Christie attributes the chief causes of beriberi to want of stimulating and nourishing diet, moisture, impure air, despondency, dirtiness, and such other circumstances as tend to debilitate. During the insurrection the troops and public followers were greatly exposed to variable weather, privation in regard to food, and other causes of physical and mental exhaustion. Fortunately, however, beriberi did not supervene.

Only one fatal case of beriberi appears on the returns during the years 1817 and 1820 inclusive. The progress of the disease in this case was remarkably rapid. On the 20th November 1817, the man was brought to hospital at Kandy about seven A. M. His whole body was swollen. The face, in particular, was bloated and leucophlegmatic. His respiration was extremely laborious. His skin was cold, particularly that of his extremities. The pulsation at the wrist was weak and irregular. He was unable to give an account of his sufferings, although they were evidently great. His countenance was anxious, and he could not remain for a few minutes at a time in one posture. It was stated by his comrades that they found him in bed about an hour before they brought him to hospital, nearly in the state above described. They likewise stated that he had been indisposed during the preceding day, but not, in their opinion, so much so as to require medical assistance. About an hour after admission he expired.

The body was inspected. The skin and muscular parts were almost colourless; four ounces of serum were

found in the pericardium. The heart was soft and flabby. The right auricle and ventricle contained coagulated blood. The liver, examined in situ, appeared large and very dark-coloured. While removing it from the body, a considerable quantity of blackish blood flowed from its large blood-vessels. By this means the organ was reduced in size, and it assumed nearly the natural colour. The venous trunks were gorged with blood of a very dark colour. No marks of pre-existing disease were discovered in the remaining viscera.

According to Dr. Christie, the leading symptoms of beriberi are, stiffness of the legs and thighs, succeeded by numbness and œdema; sometimes paralysis of the lower extremities; swelling of the whole body, attended with a sense of fulness of the belly, and more particularly with weight and oppression at the præcordia; dyspnœa; starting in the sleep, and all the symptoms of hydrothorax. The latter stage of the disease is marked by extreme dyspnœa and anxiety, increased uneasiness at the epigastrium, vomiting, spasms of different muscles, feeble pulse, livid countenance, and coldness of the extremities. The Doctor adds, that in a few cases, where the disease was no less fatal, there was not any swelling observable externally, but the patient, with the other symptoms, had evidently the bloated, leucophlegmatic face of a dropsical person.

In my remarks respecting the health of the troops in the year 1820, I observed that an unusual number of cases of anasarca had occurred among the European troops in Kandy during the above period; and that, as some of the cases were severe, perhaps they ought to have been returned under the head Beriberi. The earlier cases which appeared were remarkably mild. Until towards the end of the year, few of the cases showed any well-marked pathognomonic symptoms of beriberi.

The prominent symptoms in the earlier cases were, an anasarcous swelling, and, for the most part, a slight degree of numbness of the inferior extremities. In general, the appetite was good, and the strength did not seem to be much impaired.

The swelling rose to the belly in one case, and in another the tumefaction extended over the body, accompanied with oppressed breathing. Brisk cathartics (repeated according as they appeared necessary) and confinement to bed generally reduced the swelling and relieved the numbness in a few days, when the patient returned to duty. In the case where the thorax was affected, great and speedy relief was obtained by copious and repeated venesection.

Towards the end of December, and particularly during the month of January 1821, the disease assumed a new character. There was but little external swelling. In some cases it was not at all perceptible. A painful sense of numbness, with great feebleness of the lower extremities, became now the more distressing and obstinate symptoms. Standing, and particularly walking, gave more or less uneasiness. Sometimes a slight exertion occasioned considerable pain. The power of locomotion was greatly impaired; the gait, in bad cases, was unstable and tottering: in some instances it resembled that of a person attempting to walk on his heels. The symptoms in these cases bore a close resemblance to the disease described by Dr. Bontius, under the name of barbier or beriberi. In some cases the muscles of the lower extremities lost their firmness, and were reduced in bulk. The countenance indicated a state of indisposition, although the patients seldom made any particular complaint, except respecting the uneasiness or paralysis of the legs. The paralytic symptoms were, in general, very obstinate.

Having, in the month of January 1821, obtained permission to return to England, my opportunities of personally watching the progress of the disease then ceased. Through the kindness of Dr. Paterson, who had the immediate charge of the European hospital in Kandy, I obtained a nominal return of the men belonging to the 45th regiment who had been admitted into hospital, on account of this complaint, to the 20th February, together with brief remarks respecting each case. This return I subjoin.

Nominal Return of the Men belonging to the 45th Regiment who have been admitted into the Hospital at Kandy in consequence of having suffered, more or less, from the above-mentioned Symptoms.

No.	Names.	When first attacked. 1820.	Remarks.
1.	R. Clark.	May 30.	Has had four attacks. Swelling considerable; very little numbness; at duty.
2.	M. Dolagher.	June 27.	Has had four attacks. At duty.
3.	J. Dooner.	July 18.	Has had several attacks, in all of which there was considerable external swelling, with oppressed breathing. Venesection quickly relieved the uneasiness in the chest. At duty.
4.	P. M'Guire.		Five moderate attacks. At duty.
5.	Tho. Connel.	July 25.	Has suffered much by the complaint: inferior extremities greatly reduced; improving, although but slowly. In hospital.
6.	W. Gabbats.	July 27.	Several slight attacks. At duty.
7.	M. Hinds.	Nov. 13.	Several attacks. At duty.
8.	W. Ryan.	Nov. 29.	Has had several attacks: in his case the swelling extended to the belly.
9.	J. Camesky.	Dec. 6.	One attack; only three days in hospital. At duty.
10.	Dr. Coulin.	Dec. 8.	One attack: had no external swelling; numbness and pain of the inferior extremities have been his chief complaints. Convalescent.

No.	Names.	When first attacked. 1820.	Remarks.
11.	W. Burns.	Dec. 22.	One attack: great feebleness of the inferior extremities, with general debility. In hospital.
12.	J. Maloney.	Dec. 11.	One slight attack. At duty.
13.	J. Henson.	Jan. 3.	One severe attack: chief symptoms numbness and pain of the inferior extremities. Swelling scarcely perceptible.
14.	J. Tongue.	Jan. 10.	One attack.
15.	John M'Gill.	Jan. 24.	One attack: muscular power of the inferior extremities greatly impaired; no swelling; not improving. In hospital.

In the greater number of the above cases, the symptoms were much milder than they occur in beriberi, as described by Dr. Christie. The identity of the two diseases is, however, extremely probable. Dr. Paterson, in a note dated 12th March, informed me that P. M'Guire (No. 4, in the Nominal Return) had had another severe attack of the disease. In this attack the swelling extended over the body, attended with great dyspnœa. Another man, in a primary attack, had been affected with similar symptoms. They were both largely bled, and with immediate advantage. Brisk purgatives, slightly affecting the mouth with mercury, general frictions, and confinement to bed, soon completed their cure.

These facts are interesting, first, by showing the insidious approaches of the disease in some cases; on account of the mildness of the symptoms, the true nature of the complaint may occasionally be overlooked: secondly, in consequence of the success which has followed venesection in the three cases that were affected with oppressed breathing. Hitherto a very different plan of treatment has been followed in this disease.

The practice which chiefly prevailed, was to stimulate the system by the exhibition of spirits and cordials of various kinds. A more extended clinical experience is still necessary, before a due estimate can be made of the effects of the depletory means of cure. The subject deserves close investigation. I have every confidence in Dr. Paterson's zeal and ability to prosecute the inquiry. Should many more cases of the disease come under his care, he will have an opportunity of better ascertaining the merits of the antiphlogistic plan of cure than are now known.

The fatal case of anasarca, which appears on the returns of 1820, was that of a man belonging to the 83d regiment. He had suffered much from repeated attacks of intermittent fever. The last time he was admitted into hospital, the prominent symptoms of his complaint were, an anasarcous swelling of the whole body, and some affection of his chest. His constitution being greatly exhausted, he sunk under the dropsical symptoms in a few days.

In regard to the word *beriberi*, I have not found that the Singhalese who reside in the maritime provinces, or the Kandyans, understand that term as descriptive of a particular disease. *Bœ*, or *beri*, I am informed, means, in the Singhalese language, "unable," or "unwilling." Sometimes these words are used as synonymous with "indisposed," or "dis- "inclined." Frequently they express a sense of great weakness. Natives confined to bed often use the following expressions, in a tone of great agony, "*Mata bœ*," or "*mata beri*," (I am unable). To render the word more intensive, it is sometimes repeated, as "*bœ bœ*," "*beri beri*." The half-caste people, residing in the maritime provinces, who speak a corrupted dialect of the Portuguese language, use the phrase "*Non pode*," seemingly in the same sense as the Singhalese do the term *beri*, or *beri beri*. *Non pode*, or *merito non pode*, are terms used by the half-caste as expressive of great weakness. Among this class of people, "*non pode*" is a symptom

which attends every constitutional disease; so are the terms *beri*, or *beri beri*, among the Singhalese.

Captain Ribeiro, in his Account of Ceylon, mentions a disease, which, he says, the Singhalese called *bere bere*. His description of it is as follows: " Il y a une autre maladie, que " ceux du pays appellent *bere bere*, et à laquelle les Portu- " gais sont fort sujet; c'est une espèce de crampe, mais si vio- " lente, que ceux en sont attaqués tombent par terre, et on " couperoit par morceaux la partie malade qu'ils ne le sen- " tiroient pas. Le meilleur remède est de manger de la chair " de porc et du biscuit, de boire du vin de palmier, et de " fumer. On n'a pas veçu ainsi trois ou quatre mois, qu'on " est entièrement guéri: c'est pourquoi le Capitaine Général " Antoine Mascarenhas ordonna de l'avis des medecins que " tout le monde fumât dans le camp, et pour donner l'exemple " aux autres il fume tout le premier, et depuis on a été beau- " coup moins incommodé de cette maladie."

The *bere bere* of Captain Ribeiro differs much from the *beriberi* of Dr. Christie. The former has taken no notice of two leading symptoms of the complaint, namely, the external swelling and oppressed breathing. The epidemic cholera has appeared in some parts of India with violent spasmodic symptoms, similar to Ribeiro's " espèce de crampe." Is it not possible that cholera was the disease to which the Portuguese were then subject?

Ribeiro was a captain in the Portuguese army, serving in Ceylon when the Dutch invaded the coasts of the island. He has given an interesting account of the wars which took place at that time, betwixt the troops of the Portuguese and Dutch. Ribeiro is, so far as I know, the only author who uses the word *bere bere* as the name of a disease, previously to the period when Dr. Christie described the complaint.

Perhaps the term *beriberi*, as used both by Drs. Bontius and Christie, may have a Malay origin. Each of these authors gives this name to a disease whose pathognomonic symptoms are supposed to be different. The *beriberi* of the

former consists chiefly of numbness of the inferior extremities; whereas the leading symptoms of the *bere bere* of the latter are, general swelling, oppressed breathing, and numbness of the inferior extremities. Many of the Malays in Ceylon are acquainted with the word *beriberi.* They use it in the same sense as Dr. Bontius has done. Now, as some cases of *beri-beri,* as described by Dr. Christie, occur where there is no external swelling or difficulty of breathing, numbness of the inferior extremities being the chief source of complaint, I can easily conceive that the term *beriberi* may have been applied to the symptoms by a Malay, and that eventually the more complicated form of the disease obtained the same name. When there is no external swelling or oppressive breathing, the *beriberi* of Dr. Christie and that of Dr. Bontius presents no striking mark of distinction. An enfeebled or paralytic state of the lower extremities is the chief symptom in both. Under either of these complaints, the patients walk in a staggering manner, not unlike the gait of a sheep. It is perhaps probable that a much greater degree of connexion exists between these two diseases than is at present supposed.

CHAPTER VIII.

Ulcers.

During the insurrection, ill-conditioned ulcers of the lower extremities prevailed more or less among the different classes of troops. From the commencement of the field duties, in October 1817, sore legs were numerous among the Europeans. The ulcers did not, however, assume an extremely malignant form until towards the end of March, which was about the same period when fevers became more prevalent than they had been.

The prevalence of ulcers was not confined to the lower ranks of Europeans: commissioned officers, when exposed to

hardship and privations similar to the men, were likewise much affected with them. This troublesome complaint continued in some degree to prevail while the troops were liable to the fatiguing duties of the field. During the months of April, May, and June, they were remarkably prevalent among the Europeans.

There was a considerable number of sore legs among the Malays; but in this class of troops the ulcers were comparatively mild.

The Caffries were but very little liable to ulcerations of the lower extremities.

No class of troops suffered so much by this complaint as the Indians. Those of this class who were most liable to great variations of weather, extreme hard labour, privations in regard to food, &c. suffered in the highest degree.

The exciting cause of ulcers of the legs was, for the most part, leech-bites. A slight injury of any kind frequently degenerated into an ill-conditioned sore. Spontaneous ulcers appeared in some instances upon the legs of the Indians. This circumstance seemed to have been chiefly owing to the great constitutional debility of these people. Leech-bites were soon followed by a redness of the sides of the wound, and an uneasy itching of the part. To obviate this sensation, the person affected often increased the tendency to inflammation, by rubbing and scratching the seat of the wound. The incessant nature of the duties of the troops would not admit of individuals suspending their exertions on account of slight causes. Long marches, a circumstance to which all the troops were liable, greatly augmented the inflamed condition of wounds on the legs. Eventually, fatigue and want of cleanliness aggravated the irritable state of the ulcer, and rendered the unhappy sufferer unable to march or to perform any duty. The ulcers were therefore, for the most part, extensive and sloughy by the time the men were received into hospital. Rest and soothing treatment frequently contributed much to meliorate the sloughing state of irritable ulcers; often, how-

ever, every means failed in arresting the progress of inflammation, and a consequent extension of the ulcerated surface. Recoveries were alway tedious.

Making due allowance for considerable shades of deviation, the ulcers which prevailed at this period, assumed two different appearances. In one form, the skin which encircled the ulcerated spot was highly inflamed, and the base of the ulcer thickly covered with a whitish insensible tenacious matter, which adhered firmly to the surface of the sore. This tough substance discharged an offensive serous fluid, which stained the dressings and bandages of a dirty brown colour. Occasionally this tenacious substance was streaked and studded with small drops of blood. There was no discharge of puriform fluid. Sometimes nearly the whole leg and foot were engaged in this disease. The extension of the sloughing disposition of the parts was often extremely rapid. All the textures of the extremity, not excepting the bones, became affected: some cases occurred where the destruction of skin, tendons, &c. was so great, that the phalanges of the toes and metatarsal bones separated spontaneously from the remaining part of the foot. This excessive death of parts was not always accompanied by severe pain. Many of the patients permitted, without complaint, a considerable degree of friction, in the act of lavation, to be made upon the sloughing surface. This was particularly the case while the tough insensible substance adhered to the base of the ulcer.

The other form in which ill-conditioned ulcers appeared, at this period, was considerably different. It frequently supervened when an extensive ulcer was seemingly in a healthy state, and its surface contracting. The first circumstance that indicated an unfavourable change in the ulcer was a great increase of pain, which was often confined to a particular part of the ulcerated surface, generally to the margin of the sound skin. When examined, the skin which encircled the ulcer was found to be dark red, sometimes nearly livid. The greatest degree of discoloration of the skin always indicated

the spot where the pain was most violent. The surface of the ulcer was dark-red, and for the most part sprinkled with drops of blackish blood. A cessation of the discharge of pus instantly followed, the healthy granulations disappeared, the ulcer increased rapidly, particularly in depth, and the edges became prominent. The discharge was generally thin, brownish coloured, and very offensive. The excavation, occasioned by this species of sloughing, was frequently deep, abrupt, and sometimes resembled a perforation by an instrument. The sloughing cavity occupied often only a limited portion of the ulcerated surface. Eventually, however, it extended in a great many instances to the whole surface of the ulcer and newly cicatrized parts.

The Europeans were chiefly liable to the latter form of ulcers, the Indians to the former.

Extensive and ill-conditioned ulcers were generally more or less accompanied by some febrile affection of the system. In some instances the febrile symptoms were comparatively obscure, in others they were very well marked. Although the sufferer did not in general complain of fever, the skin was often hot, the pulse quick, and the tongue white. When the febrile symptoms were severe, the extension of the ulcer was extremely rapid. Among the Indians a colliquative diarrhœa supervened, in a number of instances, and carried off the unhappy patient in a very few days.

The prevalence of ill-conditioned ulcers among Europeans, at this period, should perhaps be attributed to a modification of the cause of endemical fever, together with unceasing hard duty, exposure to variable weather, long marches, particularly after the existence of slight ulcers on the legs, privations of various kinds, and to the liability of exciting causes, such as the bites of leeches. As a remarkable circumstance, tending to prove that the prevalence of sloughing ulcers was intimately connected with a febrile cause, it may be mentioned, that Caffries were nearly as much exempt from ulcers as they usually are from endemic fever.

The ulcers were, for the most part, in a sloughing state when the men reached an hospital station. Contagion cannot therefore be ascribed as a propagator of the disease. While in hospital, much care was taken to prevent the discharge of one ulcer from being brought into contact with another. The wards were well ventilated, so that no concentration of effluvia could occur. In regard to the Indians, they were chiefly accommodated in temporary sheds, which were open on all sides.

The Madras Seapoys, particularly the 15th regiment of native infantry, and two corps of pioneers, natives of the peninsula of India, suffered in the highest degree from gangrenous ulcerations of the lower extremities. One of the corps of pioneers was attached to the engineer department; the other belonged to that of the commissariat. The duties imposed upon both these corps, particularly the latter, were extremely laborious and exhausting.

There are many circumstances which may be assigned as tending to occasion the prevalence of ulcers of a high degree of severity, among the Madras Seapoys; and perhaps to these phenomena we should chiefly attribute their occurrence at this time. The Seapoys possess but a limited share of vigour, either of body or mind: they are very susceptible of disease, particularly of endemic fever; I would therefore ascribe the prevalence of ulcers among these people to the above circumstances, as also to great change of climate, they having been recently removed from the hot dry air of the peninsula of India to the comparatively cold and moist climate of the hilly interior of Ceylon; to great fatigue; to exposure to variable weather; to their helplessness, perhaps to their indolence in regard to the means of preparing their food; to privations of various kinds, in part arising from a disposition they had to hoard their pay, rather than to expend it (when an opportunity offered) upon useful articles of diet, &c. and to an inaptitude, from long-acquired habits, to conform themselves to the situation and

circumstances in which the service in Ceylon frequently placed them.

The two corps of pioneers were in an equal degree liable to the above predisposing causes of disease. They had, however, infinitely more harassing and fatiguing duties to perform than Seapoys; and, from the moment they arrived in Ceylon, they entertained an unconquerable aversion to the service in which they had engaged.

Provisions for the troops and public followers were, during the insurrection, chiefly brought from the maritime provinces to the hills upon men's shoulders. This expensive and tedious mode of conveyance rendered it advisable to reduce the number of inefficient consumers in the interior as much as possible. Those men, therefore, belonging to the pioneer corps, who suffered under any complaint, which would apparently render them long unfit for duty, were transferred to Colombo, and finally discharged.

The commissariat corps arrived at Kandy about the beginning of May. The average strength, until the end of the year, was 447: during that period 245 individuals were transferred, in a disabled state, chiefly by large ill-conditioned ulcers.

The corps belonging to the engineer department reached Kandy about the beginning of July. The average strength, for the succeeding six months, was 667; of this number 355 were disabled, chiefly from large ulcers, and eventually discharged.

It may be remarked, that "foul ulcers" were very prevalent among the Malays of the 1st Ceylon regiment, and the Seapoys of the 2d Ceylon regiment, during the campaign of 1803. All the troops employed on that service were much exposed to fatiguing duties, as also to the want of nutritious food.

APPENDIX.

No. I.—See page 68.

The Kandyans, as well as the natives of the peninsula of India, are acquainted with the art of preparing compound and odoriferous oils, by impregnating fixed oils with the essential oil which is contained in aromatic seeds aud barks. Oils of this kind are occasionally externally applied by the Kandyan Vederales. The process is as follows: after the aromatic substances are coarsely powdered, they are put into an earthen vessel; the fixed oil is then added, and afterwards water, sufficient to cover the dry substances, introduced. The vessel is put upon a fire, and the water made to boil. The boiling is continued until great part of the water is exhaled. During this process, the essential oil of the aromatics unites with the fixed oil, and impregnates it with the peculiar fragrance of the odoriferous seeds or barks used. Perhaps a knowledge of this fact may contribute to obviate the difficulty brought forward by the compilers of the French Encyclopedia, in regard to the cinnamon mentioned in Scripture. They aver that the kinnamon of the Hebrews, mentioned in Exodus, chap. xxx. is not that of the Greeks and Romans, the modern cinnamon. Moses was ordered (see verses 22, 23, and 24) to take cinnamon and other aromatic substances, of which he was to make "an oil of holy ointment," for the purpose of anointing the tabernacle, &c. The encyclopedists profess to think that the substance here designated by the term "kinnamon" must have been a gum, or an oil, rather than an odoriferous bark. Immediately after the enumeration of the aromatic substances, Moses is directed therewith to prepare "an oil of holy ointment; an ointment compound after "the art of the apothecary; a holy anointing oil." The process for preparing the oil, or ointment, is not further stated. There is much probability that the holy oil was prepared in a manner approximating to the process above detailed.

The following are the articles directed to be used by Moses in compounding the holy oil, or ointment.

Myrrh - - - - - - - -	shekels 500,	or about 18 lbs. Troy.
Sweet cinnamon - - - - - - - -	250	9
Calamus (acorus calamus) (Indian sweet rush) - - -	250	9
Casia - - - - - - - - - - - - -	500	18
Olive oil, a hin - - - - - - - - - - - - - - -		10

Water alone is wanted to complete the requisite substances needful for the above process.

Should the process adopted by Moses, for preparing perfumed oils, have been similar to the one practised by the Indian doctors, some conjecture may be formed in regard to the nature of the composition designated in Scripture "an holy ointment," and a "holy anointing oil." It would appear, by the 23d and 24th verses, that cinnamon entered largely into the composition of the "holy anointing oil." This substance must therefore have been extremely precious. In ancient times the trade in cinnamon was very circuitous, a circumstance which rendered this spice of great value in India.

No. II.—See page 133.

Return of the Strength of the 19*th Regiment of Foot, the annual Number of Men that joined, with the Number that died, was invalided, discharged the Service; as also the Number of Men that deserted, the Proportion per Cent. of Deaths to the whole Number, and the Number of commissioned Officers that died from the* 28*th April* 1796 *to the* 25*th December* 1816, *divided into annual Periods.*

Year.	Mean Strength.	Number of Men received.	Casualties.				Total of Casualties.	Proportion of Deaths per Cent. of the whole Number.	Number of commissioned Officers died.	Where employed.
			Died.	Invalided.	Discharged.	Deserted.				
1796: From April 28, to Dec. 31.	1035	.	20	.	2	8	30	1.9	.	At Sea; four Companies at Cape of Good Hope; four Companies at Colombo.
1797	1030	25	46	.	2	4	52	4.4	.	Colombo.
1798	1002	24	26	22	22	2	72	2.5	3	Colombo.
1799	941	11	90	2	1	.	93	9.5	3	Colombo; five Companies on Service in India.
1800	882	34	72	13	3	4	92	8.1	.	Trincomale.
1801	854	64	39	.	.	.	39	4.6	1	Trincomale.
1802	905	90	46	21	1	.	68	5.0	2	Trincomale.
1803	843	6	338	.	1	.	339	40.0	10	Kandy and Trincomale.
1804	642	138	128	12	.	.	140	19.9	3	Trincomale.
1805	528	26	44	27	16	.	87	8.3	3	Trincomale.
1806	451	10	12	12	2	1	27	2.6	.	Colombo.
1807	793	369	20	7	.	.	27	2.5	.	Colombo.
1808	828	62	17	9	12	.	38	2.0	1	Colombo.
1809	796	6	45	42	3	.	90	5.6	2	On the Peninsula of India.
1810	776	70	39	29	.	.	68	5.0	2	Colombo.
1811	729	21	17	15	17	.	49	2.3	1	Colombo.
1812	785	105	14	27	8	.	49	1.7	.	Colombo.
1813	938	202	20	11	1	.	32	2.1	1	Colombo.
1814	910	4	67	45	5	.	117	7.3	2	Trincomale.
1815	1142	349	114	63	2	.	179	9.9	5	Trincomale.
1816	1019	56	38	60	.	.	98	3.7	2	Trincomale.

Annual Proportion of Deaths per Cent. 7.2
Annual Proportion per Cent. invalided 2.4

The elements of the above Return were extracted from the Regimental Books, under the superintendence of Lieut. Hawker, the Adjutant of the Corps.

By the preceding Return it appears that the corps was more healthy during the periods it was stationed at Colombo than while it was quartered at Trincomale.

No. III.—See page 113.

Return of the mean Strength of the 1st *Battalion,* 34*th Regiment, the Number of Men who died, and the Proportion per Cent. of the Deaths to the whole Number, from the* 1st *May* 1803 *to the* 31*st December* 1814, *divided into annual Periods.*

Years.	Mean Strength.	Number of Deaths.	Proportion of Deaths per Cent. to the mean Strength.	Where employed.
1803, from 1st May to 31st Dec.	1066	24	2.2	Fort St. George.
1804	1062	86	8	Wallajabad.
1805	1090	52	4.7	Ghooty and Bellary.
1806	1053	119	11.3	Ghooty and Bellary.
1807	1041	96	9.2	Ghooty and Bellary.
1808	1007	33	3.2	Ghooty and Bellary.
1809	883	26	2.9	Ghooty and Bellary.
1810	851	115	13.5	In the field.
1811	823	170	20.6	Jaulnah.
1812	756	35	4.6	Hydrabad.
1813	728	64	8.7	Hydrabad.
1814	716	38	5.3	Seringapatnam.

Annual proportion of deaths per cent. 8.12

The annual number invalided amounted to about per cent. 1.25

During the period included in the above return, 23 commissioned officers, belonging to the regiment, died in India. They are not included in the number of deaths.

For the elements of the above Return I am indebted to Lieut. Stewart, late of the 19th regiment. Mr. Stewart was for many years in the 34th regiment, and kept an accurate abstract of the monthly returns of the corps.

No. IV.—See page 134.

Return of the mean Strength of the 45th Regiment, the Number of Men who died, and the Proportion per Cent. of the Deaths to the whole Number, from the 1st January 1815, to the 31st December 1820, divided into annual Periods.

Year.	Strength.	Number of Deaths.	Proportion per Cent. of Deaths.	Where employed.
1815	771	10	1.2	Enniskillen and Belfast.
1816	706	9	1.2	Belfast and Dublin.
1817	795	11	1.3	Dublin and Dundalk.
1818	811	11	1.3	Dundalk and Cork.
1819	699	31	4.4	On board ship till July; subsequently in Colombo and Trincomale, Ceylon.
1820	689	34	5	In the Kandyan provinces.

The average number of women belonging to the 45th regiment, from the month of July 1819, when the corps landed in Ceylon, to the 31st December 1820, was 48, of which strength 6 died during that period, being equal to about 8 per cent. per annum.

From the 1st January 1819, to the 31st December 1820, there were born, in the 45th regiment, 32 children. Of this number, 14 were alive on the 1st January 1821. Eighteen had died.

Dr. Paterson, Assistant-surgeon to the 45th regiment, furnished me with the requisite data for compiling the above Return.

No. V.—See page 134.

Return of the mean Strength of the 69th Regiment, the Number of Deaths, distinguishing the Deaths by Disease from those that happened in the Field, the Proportion of Deaths per Cent. by Disease to the whole Number; as also the Stations where the Regiment was employed, from the 1st August 1805, to the 1st January 1820, divided into annual Periods.

Years.	Mean Strength.	Killed.	Died by Disease.	Proportion of Deaths per Cent. by Disease to the mean Strength.	Where employed.
1805, from 1st Aug. to 31st Dec.	987	.	62	6.2	Poonamala, Wallajabad, Vellore.
1806	872	80	67	7.6	Vellore and Fort St. George.
1807	724	.	71	9.8	Trichinopoly.
1808	729	.	62	8.5	Trichinopoly.
1809	803	.	89	11.0	Trichinopoly and Fort St. George.
1810	788	5	36	4.5	Fort St. George, at Sea, Isle of Bourbon.
1811	811	14	155	19.1	St. Thomas' Mount, at Sea, Island of Java.
1812	812	.	90	11	The Isle of Goa.
1813	848	.	74	8.7	The Isle of Goa and Seringapatam.
1814	813	.	58	7.1	Seringapatam and Bellary.
1815	785	.	37	4.7	Bellary.
1816	745	.	37	4.9	Ghooty and Bangalore.
1817	937	.	38	4	Bangalore.
1818	971	.	84	8.6	Bangalore.
1819	1037	.	65	6	Cannanore.

Mean annual Proportion of Deaths per Cent. 8.342.

My friend, A. Mackechnie, Esq. Surgeon to the 69th regiment, supplied me with the elements of this Return.

No. VI.—See page 134.

Return of the mean Strength of the 73d Regiment (exclusively of commissioned Officers), the Number of Deaths, and the Proportion of Deaths per Cent. to the whole Strength: as also the Number invalided, from the 1st January 1818, to the 31st December 1820; divided into annual Periods.

Years.	Strength.	Number of Deaths.	Proportion of Deaths per Cent.	Number invalided.	Where employed.
1818	864	356	41.2	.	Chiefly in the Kandyan provinces.
1819	566	160	28.2	53	About one moiety of the strength in the Kandyan provinces, the others at Trincomale.
1820	533	38	7.1	52	One half at Trincomale, the other half at Point de Galle.

Mean Proportion of Deaths per Cent. 25.5
Annual Proportion invalided per Cent. 5.3

Return of the mean Strength of the commissioned Officers of the 73d Regiment, the Number of Deaths, and the Proportion of Deaths per Cent. to the whole Strength, from the 1st January 1818, to the 31st December 1820.

Years.	Strength.	Number of Deaths.	Proportion of Deaths per Cent.
1818	54	7	14.8
1819	50	7	14
1820	40	2	5

Mr. Hay, the Adjutant of the 73d regiment, very kindly furnished me with the elementary data for framing the above Returns.

No. VII.—See page 134.

Return of the mean Strength of the 83d Regiment, the Diseases which proved fatal (or Causes of Death), the Number of Deaths, and the Proportion of Deaths per Cent. to the whole Strength; as also the Number invalided from the 1st January 1818, to the 31st December 1820: divided into annual Periods.

Years.	Mean Strength.	Diseases or Causes of Death.																					Total Deaths.	Number of Deaths per Cent. of the mean Strength.	Number invalided.	Where employed.
		Endemic Fever.	Enteritis.	Hepatitis Acut.	Hepatitis Chron.	Variola.	Erysipelas.	Phthisis Pulmon.	Dysenteria Acut.	Dysenteria Chron.	Apoplexia.	Tetanus.	Cholera Epidemica.	Hydrothorax.	Physconia.	Vulnus Sclop.	Contusio.	Amputatio.	Drowned.	Died at Sea.	Excessive Fatigue.	Unknown.	Suicide.				
1818	980	60	1	2	6	.	.	.	25	14	1	1	.	.	.	2	.	1	4	.	6	.	.	123	12.5	2	About two thirds of the strength in the Kandyan provinces; the remainder in Colombo and Galle.
1819	843	20	2	1	2	1	1	.	21	5	1	.	25	1	1	.	1	.	2	1	.	.	.	85	10	46	Nearly one third of the corps in the Kandyan provinces; the remainder in Colombo.
1820	792	.	.	4	.	.	.	1	15	.	1	.	1	.	.	.	.	.	3	.	.	1	1	27	3.4	116	579 in Colombo, and 210 in the Kandyan provinces; the proportion of deaths in the Kandyan country was about 6 per cent.; at Colombo about 2.5.

Mean annual Proportion of Deaths per Cent. 8.6
Mean Proportion invalided per Cent. 6.2

The average strength of women belonging to the 83d regiment during the above three years amounted to 90: the number who died was 15; or 5.5 per cent. annually.

The average number of children of all ages was 102: during the three years 37 died; or about 12.3 per cent. annually.

The elements of this Return were obligingly furnished to me by Mr. Knott, Hospital Assistant, who procured them from the Adjutant of the Corps.

No. VIII.—See page 142.

I beg here to mention a striking instance of the obscurity of the remote cause of disease. The very limited extent of the influence of the cause is another remarkable circumstance. The disease in question has received a number of appellations, namely, elephantiasis, the Barbadoes leg, Cochin leg, &c. In Ceylon it is generally known by the term Galle leg. The complaint is endemial on the western and southern coast of Ceylon, or from Caltura to Belligam, a distance of about sixty miles. The inhabitants inland are not liable to the disease. It is particularly prevalent at Galle, Bentotte, and Belligam. The Galle leg is not endemial in any other part of Ceylon except upon a low ridge of hills, which runs inwards from the sea and lies upon the confines of the Baticaloe district, where it joins that of Trincomale. The local aspects of these two portions of the island are remarkably different. Elephantiasis is very rare in the Kandyan provinces. I have seen only one case which originated there.

The symptoms of elephantiasis are concisely detailed in Dr. Bateman's Synopsis of Cutaneous Diseases, third edition, page 308.

Some classes of people are much more liable to the disease than others. The half-cast race and the pure Singhalese are particularly obnoxious to it. In Galle, I suppose nearly one half of the adults of the former class are more or less affected with morbid enlargements of some parts of their bodies. The descendants of unmixed Europeans are liable to be affected. Only one instance is known of a person born in Europe having had elephantiasis in Ceylon. This individual was a Savoyard, and had resided about forty years in Galle. Malays, Caffries, and the natives of the peninsula of India, appear to be little liable to the disease.

The morbid swelling is not exclusively confined to the leg. Sometimes it appears in the arms, scrotum, and thighs. There was a half-cast man at Galle who had the disease in both of his superior, and also his inferior extremities. Persons labouring under elephantiasis generally obtain a suspension of the progress of the disease, by a removal to a part of the island where it is not

endemial. An inhabitant of Galle had, at regular intervals, the febrile paroxysm, and a concomitant effusion in one of his legs. He changed his place of abode from Galle to Jafna, where he resided about a year. While at Jafna he had not a single paroxysm of the disease. At the termination of the above period he returned to Galle, and had the usual febrile paroxysm in a few days after his arrival.

Elephantiasis attacks females as well as males. It seems to be as prevalent among the wealthy as it is among the poor and indigent. The health and agility of patients labouring under this disease are, for a long period, little affected, except during the febrile paroxysm. When the swelling is large and situated towards the ankle, the active motions of the limb become greatly retarded. In consequence of the friction of the horny or pendulous protuberances upon other parts of the leg, exulceration occurs, followed by ill-conditioned sores. Life now becomes miserable, and the health suffers. The extent to which the leg enlarges in some cases is almost beyond belief. I recollect being requested to visit a young woman whose inferior extremities were so enormously enlarged, that the back part of each leg projected beyond the heel, and rested upon the ground for about nine or ten inches. The fissures between the protuberances had ulcerated, and discharged an extremely offensive sanies.

No. IX.—See page 134.

Return of the mean Strength of the 1st *Ceylon Regiment (European Officers excepted), the Number invalided, the Number of Deaths (distinguishing the Deaths by Disease from those who died in the Field), the Proportion of Deaths by Disease per Cent. to the Average Strength; as also the Stations where the Regiment was employed from* 25th *August* 1811, *to* 31st *December* 1820: *divided into annual Periods.*

Years.	Mean Strength.	Invalided.	Killed in the Field.	Died of Disease.	Proportion of Deaths per Cent. of the mean Strength.	Where employed.
From 25th Aug. till 25th Dec. 1811	729	.	.	7	0.9	Trincomale.
To 25th Dec. 1812	730	4	.	18	2.4	Trincomale.
1813	700	50	.	80	11.4	Trincomale till May; subsequently at Galle.
1814	999	48	.	16	1.6	Galle and Colombo.
1815	1102	14	.	22	2	Colombo.
1816	1166	76	.	13	1.1	Colombo.
1817	1231	.	10	12	0.9	Colombo till November; subquently in the Kandyan Provinces.
1818	1203	.	19	54	4.4	Kandyan Provinces.
1819	1285	.	.	67	5.2	Chiefly in the Kandyan Provinces.
1820	1288	15	.	51	4	Kandyan Provinces.

Except during the year 1813, when a violent fever prevailed at Trincomale, it would appear, by the above Return, that the Malays are more healthy on the coast than in the interior.

Return of the Mortality which occurred among the European commissioned Officers of the 1*st Ceylon Regiment from the* 1*st January* 1811, *to the* 31*st December* 1820.

Average Strength of the Officers employed in Ceylon about	Number and Rank of Officers who died.							
	Field Officer.	Captains.	Subalterns.	Adjutant.	Quarter-Masters.	Surgeon.	Assistant-Surgeons.	Total.
26	1	7	17	1	2	1	3	32

Annual Average of Mortality per Cent. 12.3.

For the elements of the two preceding Returns I am indebted to my friend John Banstead, Esq. Paymaster to the 1st Ceylon regiment. During part of the period included in the Return I was Surgeon to this corps.

THE END.

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